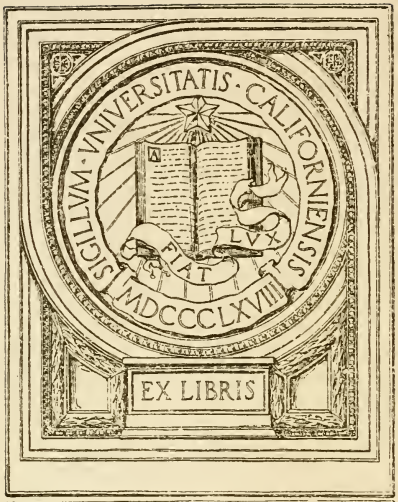
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THE SIEGE AND CONQUEST OF THE NORTH POLE

THE
SIEGE AND CONQUEST
OF THE
NORTH POLE

BY
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PREFACE

My chief object in compiling this work has been to supply a brief account of the main efforts which have been made to reach the North Pole. The subject is now so extensive that few have the opportunity of covering the whole ground. While the exciting and specially interesting incidents have not been omitted, the book aims at giving the reader an intelligent idea of the equipment and other means by which the work of exploration has been carried on.

The many expeditions which have set out to find a north-west or a north-east passage do not come within the scope of the book, except when they have had some special bearing on the struggle for the Pole.

Those who may wish to pursue the subject further by consulting the original authors can be assured that no works of fiction relate greater deeds of heroism than are found in the records of Arctic exploration; and that while they may satisfy their love for the adventurous they will add something to their geographical knowledge.

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It is hoped that the maps may be of considerable assistance in enabling the reader to follow the narrative. The spelling of geographical and other names is generally that adopted by the authors of the original works.

GEORGE BRYCE.

BIRMINGHAM, *December* 1909.

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GLOSSARY OF ARCTIC TERMS

Beset, so enclosed by floating ice as to be unable to navigate.

Bore, to force through loose or recent ice.

Calf, detached mass from berg or glacier, rising suddenly to the surface.

Crow's nest, a look-out place attached to the topgallant-masthead.

Dock, an opening in the ice, artificial or natural, offering protection.

Drift ice, detached ice in motion.

Field ice, an extensive surface of floating ice.

Floe, a detached portion of a field.

Hummocks, ridges of broken ice formed by collision of fields.

Ice-blink, a peculiar appearance of the atmosphere over distant ice.

Ice-foot, the ice which adheres to the coast above the ordinary level of the sea.

Lane or lead, a more or less navigable opening in the ice.

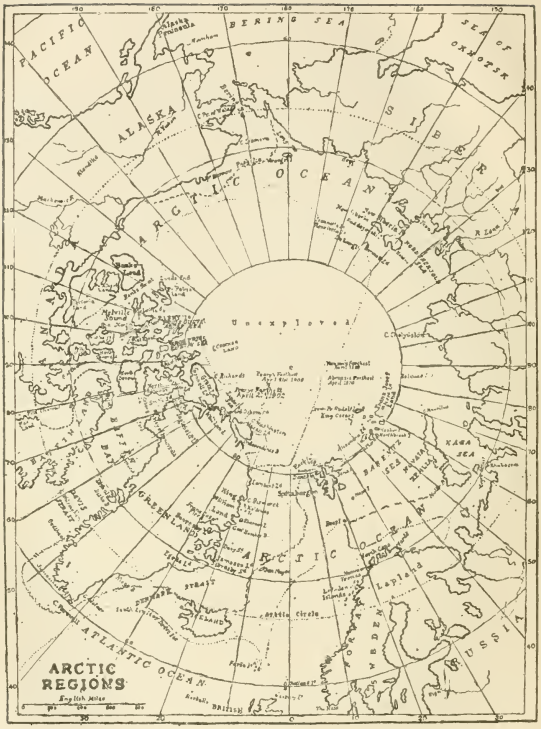
Nip, the condition of a vessel pressed upon by ice on both sides.

Pack, a large area of floating masses of ice driven together more or less closely.

Palæocrystic ice, the name given by Nares to the old ice of the Polar Sea.

Polynia, a Russian term for an open-water space.

Rue-raddy, a shoulder-belt to drag by.


ARCTIC REGIONS
PACIFIC OCEAN
BERING SEA
SEA OF OKHOTSK
ALASKA
SIBERIA
ARCTIC OCEAN
Unexplored
GREENLAND
ATLANTIC OCEAN
KARA SEA
Lapland
RUSSIA
Arctic Circle
BAFFIN BAY
DAVIS STRAIT
BARENTS SEA
NORWEGIAN SEA

INTRODUCTION

"There's a flag on the mast, and it points to the north,
And the north holds the land that I love;
I will steer back to northward, the heavenly course
Of the winds guiding sure from above."

FRITHJOF'S *Saga*.

THE North Pole is the centre of the Northern Hemisphere. This hemisphere contains Europe, Asia, North America, and a large part of Africa, yet no human being reached its centre before the eighth year of the twentieth century A.D.

The North Pole is the point where the axis of the earth cuts its surface. It is the point where, as Captain Hall expressed it, there is no north, no east, no west. It is the place where every wind that blows is a south wind. It is a point where all the meridians meet, and there is therefore no longitude. It is one of the two places on the surface of the earth where there is but one night and one day in every year. It is a point from which all the heavenly bodies appear to move in horizontal courses, and the stars never set. It is not to be confused with the magnetic pole, which is situated about 1600 miles south of it, near the mainland of North America. At the North Pole the magnetic needle points due south.

The North Pole is therefore a place of absorbing interest, and until it was reached man never rested satisfied. Ever since Robert Thorne, in the reign of

Henry VIII., offered "very weighty and substantial reasons to set forth a discoverie even to the North Pole," the struggle has been going on.

In no other records of adventure do we find greater deeds of daring than in those of Arctic travel. The dauntless courage in the face of extreme danger, the perseverance when hope was forlorn, the self-sacrifices made to render assistance to comrades, all stamp these pioneers of science and commerce as heroes in the highest sense of the word. Some of their daring exploits, their successes and disasters, are here recorded, but the author hopes that this book will only serve as an introduction to the original ones. After reading the thrilling narratives of Arctic exploration, one is ready to admit that "truth is stranger than fiction."

The Polar regions can be reached by only three navigable routes. Either by the wide passage between Greenland and Norway, a smaller passage between Greenland and America, or by the narrow Bering Strait between America and Russia.

Up till the beginning of the nineteenth century nearly all the Arctic voyages had as the chief object the discovery either of a north-west or a north-east passage to the Pacific Ocean.

On the 7th June 1585 two tiny craft sailed from Dartmouth in quest of the North-West Passage. They were commanded by John Davis, a daring explorer.

Davis sighted Greenland on 20th July, and on the 29th he was off where now stands the Danish settlement of Godthaab. He crossed the strait which now bears his name, and traced part of the western coast.

Davis made a second voyage in 1586, and a third in 1587. In the latter year he reached and named Sanderson's Hope, in 72° 41′.

Between 1594 and 1596 three expeditions were dis-

patched by the Dutch towards Spitzbergen. That of 1596 is of special interest. William Barents, the discoverer of Spitzbergen, was the chief pilot. The ship reached Ice Haven, Novaya Zemlya, on 26th August, and here the party were forced to winter. A house was built with wood, but the winter was passed miserably, scurvy ultimately making its appearance among the crew. The ship being hopelessly beset by the ice, it was decided during the following summer to abandon it.

In two boats, the party of fifteen men started on a journey of 1524 miles. Barents himself and one of the crew were ill, and had to be dragged on a sledge from the house to the boats. Both died on the boat-journey. The remainder ultimately reached Russian Lapland, where their troubles ceased.

About 274 years afterwards, the house built by Barents was discovered by Captain Carlsen. Over the fireplace still stood the cooking-pans, an old clock was against the wall, and arms, tools, drinking-vessels, and books were found as they had been left nearly three centuries before.

In 1607, Henry Hudson endeavoured to reach the Pole along the east coast of Greenland. He attained 73° at a point which he named "Hold with Hope."

He then examined the edge of the ice between Greenland and Spitzbergen, and reached the latitude of 80° 23'. He named the north-west point of Spitzbergen "Hakluyt Headland," and on his way home he discovered the island now known as "Jan Mayen."

In 1610 he discovered Hudson's Strait, and the great bay which bears his name.

On 26th March 1616, Robert Bylot as master, with William Baffin as pilot and navigator, set out from Gravesend in the *Discovery*, a craft of only 55 tons. Greenland was sighted on 14th May, and on the 30th May, Sanderson's Hope, the farthest point of Davis,

was reached. On the 9th June he discovered Baffin Islands, in 73° 54′. He then took what is known as the "Middle Passage" across Melville Bay, and reached the "North Water" of the whalers of to-day.

Baffin discovered and charted Wolstenholme Sound and Hakluyt Island, and passed north till he was within sight of Cape Alexander. He named Smith Sound after the first Governor of the East India Company. He also discovered Carey Islands, Lancaster Sound, and Jones Sound.

When we consider the wretched means with which these early explorers were provided, we are lost in astonishment at their audacity and at the success of their achievements.

It was exactly two hundred years afterwards that these northern places were visited by Ross and Parry. Baffin's work had been almost forgotten, and his discoveries were not believed.

During the seventeenth century many expeditions were sent out which were the means of opening up extensive commercial relations with Russia and of establishing the fisheries of Spitzbergen, Davis Straits, and Newfoundland.

During the eighteenth century several expeditions were fitted out by the Hudson Bay Company, and a good deal of exploration was done by the Russians. In 1728, Vitus Bering discovered the straits which now bear his name; and in 1742, Lieutenant Chelyuskin reached the most northerly point of Asia in 77° 34′ by sledges. In 1765, Admiral Tschitschagoff was sent by the Czarina Catharine of Russia with three vessels to Spitzbergen to sail towards the North Pole. He reached 80° 21′, but found it impossible to advance farther. The following year he reached 80° 28′. In 1770 the New Siberian Islands were discovered by Liakhof.

In 1773, Constantine John Phipps, afterwards Lord

Mulgrave, sailed with the *Racehorse* and *Carcass*, with a view of reaching the North Pole. He reached 80° 37′, and visited some of the Seven Islands. He also mapped the north of Spitzbergen. In this expedition the great Horatio Nelson was captain's coxswain on board the *Carcass*.

In 1818, Captain Buchan in the *Dorothea*, and Lieutenant (afterwards Sir John) Franklin in the *Trent*, attained 80° 34′ north of Spitzbergen.

In 1823, Clavering and Sabine, in the ship *Griper*, visited Spitzbergen, and while Sabine carried on magnetic observations on the inner Norway Island, Clavering went to sea and steered northwards, but did not get farther than 80° 20′.

The edge of the ice had now been thoroughly examined between the coast of Greenland and Novaya Zemlya, and it became evident that the ice could not be pierced by a ship. It occurred to Sir John Franklin and Sir Edward Parry that the best way of reaching the Pole would be by means of sledging over the ice. Parry put his ideas into practice in 1827, when he undertook his well-known expedition in the *Hecla*. He had just returned from his third Arctic voyage in search of the North-West Passage. His fourth voyage was an important one, and will be treated at some length in the first chapter.

THE SIEGE AND CONQUEST OF THE NORTH POLE

CHAPTER I

PARRY'S EXPEDITION OF 1827

In April 1826, Captain William Edward Parry proposed to Viscount Melville, First Lord Commissioner of the Admiralty, "to attempt to reach the North Pole, by means of travelling with sledge-boats over the ice, or through any spaces of open water that might occur." The proposal was referred to the Royal Society, who strongly recommended its adoption; and an expedition having been equipped, Parry was appointed to the command of it.

Before making the proposal, Parry had given the subject careful consideration. He mentions that Captain Lutwidge, the associate of Captain Phipps in the expedition towards the North Pole in 1773, describes the ice north of Spitzbergen to the distance of ten or twelve leagues to have the appearance of "one continued plain of smooth unbroken ice, bounded only by the horizon." The testimony of Mr. Scoresby, Jun., "a close and intelligent observer of Nature in these regions," was also found to agree with that given by Lutwidge. "I once saw," says he, "a field that was so free from either fissure

or hummock, that I imagine, had it been free from snow, a coach might have been driven many leagues over it in a direct line, without obstruction or danger." In addition to these, experienced whalers, whom Parry consulted as to the nature of the ice, agreed that it was highly favourable for the purpose of his expedition. An important factor in determining Parry to make the proposal was the fact that Franklin had drawn up a plan for making the attempt on the same lines.

For the journey over the ice, two boats were constructed having great flatness of floor, with the extreme breadth carried well forward and aft, and possessing the utmost buoyancy, as well as capacity for stowage. Their length was 20 feet, and their extreme breadth 7 feet. The timbers were made of tough ash and hickory, 1 inch by half an inch square, and a foot apart, with a "half-timber" of smaller size between each two. On the outside of the frame thus formed was laid a covering of Mackintosh's waterproof canvas, the outer part being coated with tar. Over this was placed a plank of fir, $\frac{3}{16}$ of an inch thick; then a sheet of stout felt; and over all, an oak plank of the same thickness as the fir; the whole of these being firmly and closely secured to the timbers by iron screws applied from without. "On each side of the keel, and projecting considerably below it, was attached a strong 'runner' shod with smooth steel, in the manner of a sledge, upon which the boat entirely rested while upon the ice; and to afford some additional chance of making progress on hard and level fields, we also applied to each boat two wheels, of 5 feet diameter, and a small one abaft, having a swivel for steering by, like that of a Bath chair; but these, owing to the irregularities of the ice, did not prove of any service, and were subsequently relinquished. A 'span' of hide-rope was attached to the fore part of the runners, and to this

were affixed two strong ropes of horse-hair, for dragging the boat; each individual being furnished with a broad leathern shoulder-belt, which could readily be fastened to or detached from the drag-ropes." The boats weighed 1539 lb. and 1542 lb. respectively. Two officers and twelve men were selected for each boat's crew. The provisions consisted of biscuit, sweetened cocoa-powder, and pemmican. The process of making the latter consisted in drying large thin slices of the lean of the meat over the smoke of wood fires, then pounding it, and lastly mixing it with about an equal weight of its own fat. In this state it was quite ready for use, without further cooking.

The *Hecla*, which was to convey the expedition to the north coast of Spitzbergen, left the Thames on the 25th of March 1827. They arrived at Hammerfest on 18th April. Here they obtained a small quantity of venison and an abundance of good fish. They also purchased a set of snow-shoes, together with Lapland shoes (called "Kamooga"). They also took on board eight reindeer and a supply of moss. "The quantity of *clean* moss considered requisite for each deer per day is 4 pounds, but they will go five or six days without provender, and not suffer materially. As long as they can pick up snow as they go along, which they like to eat quite clean, they require no water; and ice is to them a comfortable bed."

Hammerfest was left on 29th April, and on the 5th of May, in latitude 73° 30′, the first straggling mass of ice was met. After some delay in waiting for the ice to open, Hakluyt's Headland was reached on 14th May. While preparations were being made to land a quantity of provisions here, a gale came on, and forced Parry to take shelter among the pack-ice, where he remained beset twenty-four days. Now began a search for a suitable

harbour for the *Hecla*, but it was not till the 20th June that this was found in Treurenburg Bay. During this search Parry reached as far north as 81° 5′, and landed a small store of provisions on Walden Island, and another on an islet near Little Table Island.

Preparations were now made to leave the ship on the journey to the north. Parry writes: "As it was still necessary not to delay our return beyond the end of August, the time originally intended, I took with me only seventy-one days' provisions; which, including the boats and every other article, made up a weight of 260 lb. per man; and as it appeared highly improbable, from what we had seen of the very rugged nature of the ice we should first have to encounter, that either the reindeer, the snow-shoes, or the wheels would prove of any service for some time to come, I gave up the idea of taking them. We, however, constructed out of the snow-shoes four excellent sledges for dragging a part of our baggage over the ice, and these proved of invaluable service to us, while the rest of the things just mentioned would only have been an encumbrance."

The *Hecla* was left on the 21st June, and Low Island was reached on the 22nd. One of the ship's cutters accompanied the two boats in order to carry part of the provisions which were to be landed on Low Island and on Walden Island. Open water for the boats was found until they reached latitude 81° 12′ 51″, which was now the highest that had ever been reached. Scoresby, in 1806, had reached 81° 12′ 42″, and with this exception no one had ever reached the 81st degree.

Parry now writes: "Our plan of travelling being nearly the same throughout this excursion, after we first entered upon the ice, I may at once give some account of our usual mode of proceeding. It was my intention to travel wholly at night, and to rest by day, there being,

of course, constant daylight in these regions during the summer season. The advantages of this plan, which was occasionally deranged by circumstances, consisted first, in our avoiding the intense and oppressive glare from the snow during the time of the sun's greatest altitude, so as to prevent, in some degree, the painful inflammation in the eyes, called 'snow-blindness,' which is common in all snowy countries. We also thus enjoyed greater warmth during the hours of rest, and had a better chance of drying our clothes; besides which, no small advantage was derived from the snow being harder at night for travelling. The only disadvantage of this plan was, that the fogs were somewhat more frequent and more thick by night than by day, though even in this respect there was less difference than might have been supposed, the temperature during the twenty-four hours undergoing but little variation. This travelling by night and sleeping by day so completely inverted the natural order of things, that it was difficult to persuade ourselves of the reality. Even the officers and myself, who were all furnished with pocket chronometers, could not always bear in mind at what part of the twenty-four hours we had arrived; and there were several of the men who declared, and I believe truly, that they never knew night from day during the whole excursion.

"When we rose in the evening, we commenced our day by prayers, after which we took off our fur sleeping-dresses, and put on those for travelling; the former being made of camblet, lined with racoon-skin, and the latter of strong blue box-cloth. We made a point of always putting on the same stockings and boots for travelling in, whether they had dried during the day or not; and I believe it was only in five or six instances, at the most, that they were not either still wet or hard-frozen. This, indeed, was of no consequence beyond the discomfort of

first putting them on in this state, as they were sure to be thoroughly wet in a quarter of an hour after commencing our journey; while, on the other hand, it was of vital importance to keep dry things for sleeping in. Being 'rigged' for travelling, we breakfasted upon warm cocoa and biscuit, and after stowing the things in the boats and on the sledges, so as to secure them, as much as possible, from wet, we set off on our day's journey, and usually travelled from five to five and a half hours, then stopped an hour to dine, and again travelled four, five, or even six hours, according to circumstances. After this we halted for the night, as we called it, though it was usually early in the morning, selecting the largest surface of ice we happened to be near, for hauling the boats on, in order to avoid the danger of its breaking up by coming in contact with other masses, and also to prevent drift as much as possible. The boats were placed close alongside each other, with their sterns to the wind, the snow or wet cleared out of them, and the sails, supported by the bamboo masts and three paddles, placed over them as awnings, an entrance being left at the bow. Every man then immediately put on dry stockings and fur boots, after which we set about the necessary repairs of boats, sledges, or clothes; and, after serving the provisions for the succeeding day, we went to supper. Most of the officers and men then smoked their pipes, which served to dry the boats and awnings very much, and usually raised the temperature of our lodgings 10° or 15°. This part of the twenty-four hours was often a time, and the only one, of real enjoyment to us: the men told their stories and 'fought all their battles o'er again,' and the labours of the day, unsuccessful as they too often were, were forgotten. A regular watch was set during our resting-time, to look out for bears or for the ice breaking up round us, as well as to attend to the drying of

the clothes, each man alternately taking this duty for one hour. We then concluded our day with prayers, and having put on our fur dresses, lay down to sleep with a degree of comfort, which perhaps few persons would imagine possible under such circumstances; our chief inconvenience being, that we were somewhat pinched for room, and therefore obliged to stow rather closer than was quite agreeable. The temperature, while we slept, was usually from 36° to 45°, according to the state of the external atmosphere; but on one or two occasions, in calm and warm weather, it rose as high as 60° to 66°, obliging us to throw off a part of our fur dress. After we had slept seven hours, the man appointed to boil the cocoa roused us, when it was ready, by the sound of a bugle, when we commenced our day in the manner before described.

"Our allowance of provisions for each man per day was as follows:—

"Biscuit, 10 oz.; pemmican, 9 oz.; sweetened cocoa-powder, 1 oz. to make 1 pint; rum, 1 gill; tobacco, 3 oz. per week.

"Our fuel consisted entirely of spirits of wine, of which 2 pints formed our daily allowance, the cocoa being cooked in an iron boiler over a shallow iron lamp, with seven wicks; a simple apparatus, which answered our purpose remarkably well. We usually found 1 pint of spirits of wine sufficient for preparing our breakfast—that is, for heating 28 pints of water, though it always commenced from the temperature of 32°."

They set off on their first journey over the ice on 24th June. Instead of the fine level floes they expected, they found the ice consisting of pieces of small extent and very rugged, obliging them to make three journeys, and sometimes four, with the boats and baggage, and to launch several times across narrow pools of water. They ex-

perienced a great amount of rain, and had sometimes to wade through water from 2 to 5 inches deep upon the ice. It was rarely that they met with a surface sufficiently level and hard to drag all their loads at one journey. Deep soft snow was frequently met with, and proved a difficult obstacle to overcome. At other times their way lay across small loose pieces of ice, and the boats had to be made to serve the purpose of a bridge between the pieces. After a laborious day's work, they frequently found that they had not progressed more than 2 miles. It had been calculated that they could travel 20 miles per day over level ice. They found the Lapland shoes, or Kamoogas, good for walking in when the snow was dry, but when it was wet they found Esquimaux boots much superior. On the 5th of July they had reached latitude 81° 45′ 15″, and on sounding with 400 fathoms of line failed to reach the bottom. A like result was met in latitude 82° 17′ 10″, which was reached on 13th July. About this date they found that they were being drifted considerably to the south—sometimes 1 or 2 miles per day. The glare of the sun was often very oppressive: the best preservative was found to be spectacles having the glass of a bluish-green colour, and with side-screens to them. On the 20th July they reached 82° 36′ 52″, less than 5 miles to the northward of their position on the 17th, although they calculated they certainly had travelled 12 miles. On the 25th July, Parry wrote: "So small was the ice now around us, that we were obliged to halt for the night at 2 a.m., being upon the only piece in sight, in any direction, on which we could venture to trust the boats while we rested. Such was the ice in the latitude of $82\frac{3}{4}$°!"

At noon on the 26th they found the latitude 82° 40′ 23″, and calculated that since midnight on the 22nd they had lost no less than $13\frac{1}{2}$ miles by drift. At this time Parry

writes: "It had, for some time past, been too evident that the nature of the ice with which we had to contend was such, and its drift to the southward, especially with a northerly wind, so great, as to put beyond our reach anything but a very moderate share of success in travelling to the northward. Still, however, we had been anxious to reach the highest latitude which our means would allow, and, with this view, although our whole object had long become unattainable, had pushed on to the northward for thirty-five days, or until half our resources were expended, and the middle of our season arrived. For the last few days, the 83rd parallel was the limit to which we had ventured to extend our hopes; but even this expectation had become considerably weakened since the setting in of the last northerly wind, which continued to drive us to the southward, during the necessary hours of rest, nearly as much as we could gain by eleven or twelve hours of daily labour. Had our success been at all proportionate to our exertions, it was my full intention to have proceeded a few days beyond the middle of the period for which we were provided, trusting to the resources we expected to find at Table Island. But this was so far from being the case, that I could not but consider it as incurring useless fatigue to the officers and men, and unnecessary wear and tear for the boats, to persevere any longer in the attempt. I determined, therefore, on giving the people one entire day's rest, which they very much needed, and time to wash and mend their clothes, while the officers were occupied in making all the observations which might be interesting in this latitude; and then to set out on our return on the following day."

The bottom was found here with 500 fathoms of line. At the extreme point of the journey the distance from the *Hecla* was 172 miles. To accomplish this distance,

Parry reckoned they travelled 292 miles, of which about 100 were performed by water previous to entering the ice. But as they travelled by far the greater part of the distance on the ice three, and not unfrequently five times over, the total distance estimated was 580 geographical, or 668 statute miles, being nearly sufficient to have reached the Pole in a direct line.

Returning south, open water was reached in latitude 81° 34′, about 50 miles north of Table Island. The party had been forty-eight days on the ice. During this journey several seals and bears were killed, and these assisted very much both for meat and fuel. The islet at Table Island was reached on the 12th of August, and it was found that bears had devoured all the bread, amounting to 100 lb., left there. To this islet Parry applied the name of Lieutenant Ross. The *Hecla* was reached on 21st August, after an absence of sixty-one days, and the total distance travelled was estimated at 1127 miles. Parry writes: "Considering our constant exposure to wet, cold, and fatigue, our stockings having generally been drenched in snow-water for twelve hours out of every twenty-four, I had great reason to be thankful for the excellent health in which, upon the whole, we reached the ship. There is no doubt that we had all become, in a certain degree, gradually weaker for some time past; but only three men of our party now required medical care, two of them with badly swelled legs and general debility, and the other from a bruise; but even these three returned to their duty in a short time."

The *Hecla* left Treurenburg Bay on 28th August, rounded Hakluyt's Headland on the 30th, and arrived at Shetland on 17th September. Here Parry left the ship, and proceeded to London *via* Inverness.

Having finished his narrative of this attempt to reach the North Pole, Parry makes the following observations:—

"That the object is of still more difficult attainment than was before supposed, even by those persons who were the best qualified to judge of it, will, I believe, appear evident from a perusal of the foregoing pages; nor can I, after much consideration and some experience of the various difficulties which belong to it, recommend any material improvement in the plan lately adopted. Among the various schemes suggested for this purpose, it has been proposed to set out from Spitzbergen, and to make a rapid journey to the northward, with sledges, or sledge-boats, drawn wholly by dogs or reindeer; but, however feasible this plan may at first sight appear, I cannot say that our late experience of the nature of the ice which they would probably have to encounter, has been at all favourable to it. It would, of course, be a matter of extreme imprudence to set out on this enterprise without the means of crossing —not merely narrow pools and lanes—but more extensive spaces of open water, such as we met with between the margin of the ice and the Spitzbergen shores; and I do not conceive that any boat sufficiently large to be efficient and safe for this purpose, could possibly be managed upon the ice, were the power employed to give it motion dependent on dogs or reindeer. On the contrary, it was a frequent subject of remark among the officers, that reason was a qualification scarcely less indispensable than strength and activity, in travelling over such a road; daily instances occurring of our having to pass over difficult places, which no other animal than man could have been easily prevailed upon to attempt. Indeed, the constant necessity of launching and hauling up the boats (which operations we had frequently to perform eight or ten, and on one occasion, seventeen times in the same day) would alone render it inexpedient, in my opinion, to depend chiefly upon other animals; for it would certainly require more time and labour to get

them into and out of the boats, than their services in the intervals, or their flesh ultimately used as food, would be worth; especially when it is considered how large a weight of provender must be carried for their own subsistence.

"In case of employing reindeer, which, from their strength, docility, and hardy habits, appear the best suited to this kind of travelling, there would be an evident advantage in setting out much earlier in the year than we did; perhaps about the end of April, when the ice is less broken up, and the snow much harder upon its surface, than at a more advanced part of the season. But this, it must be recollected, would involve the necessity of passing the previous winter on the northern coast of Spitzbergen, which, even under favourable circumstances, would probably tend to weaken in some degree the energies of the men; while, on the other hand, it would be next to impossible to procure there a supply of provender for a number of tame reindeer, sufficient even to keep them alive, much less in tolerable condition, during a whole winter. In addition to this, it may be observed, that any party setting out earlier must be provided with a much greater weight of warm clothing, in order to guard against the severity of the cold, and also with an increased proportion of fuel for procuring water by the melting of snow, there being no fresh water upon the ice, in these latitudes, before the month of June."

Parry's attempt to reach the Pole, hauling heavy boats over the ice, brings into prominence the determination and daring of English sailors. Parry's record of 82° 45′ remained unbroken forty-eight years, when a new record was again made by English sailors in an exactly similar way to that of Parry, but in a different region.

The next expedition of importance after Parry's was that of Sir John Franklin in search of the North-West

Passage, and does not strictly come within the scope of this book. Although the many expeditions which were sent out in search of Franklin and his men were the means of tracing a great extent of coast-line among the islands which lie to the north of America, only one had any special bearing on the struggle for the Pole. This was the one commanded by Dr. Kane, and will be treated in the next chapter.

CHAPTER II

KANE'S EXPEDITION (1853, '54, '55)

In December 1852, Dr. Kane received orders from the Secretary of the U.S. Navy to conduct an expedition to the Arctic seas in search of Sir John Franklin. Dr. Kane's plan of search was based upon the probable extension of the land-masses of Greenland to the Far North—a fact at that time not verified by travel, but sustained by the analogies of physical geography. As inducements in favour of his scheme, he mentioned—

"(1) *Terra firma* as the basis of our operations, obviating the capricious character of ice-travel.

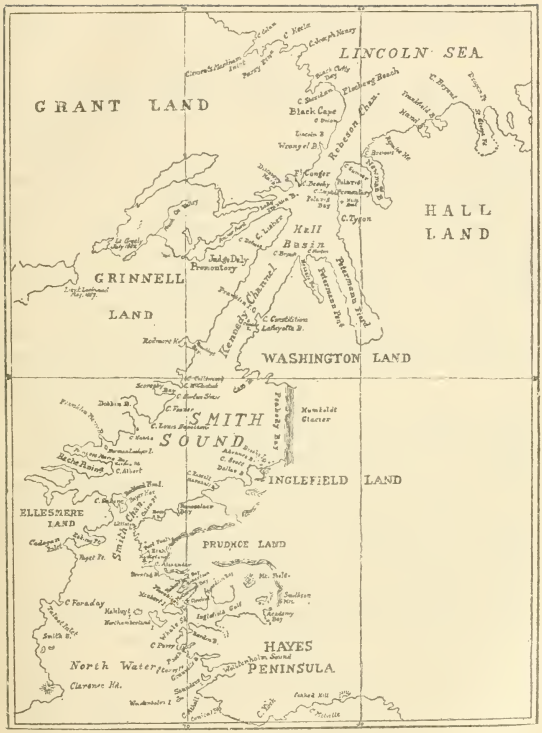
"(2) A due northern line, which, throwing aside the influences of terrestrial radiation, would lead soonest to the open sea, should such exist.

"(3) The benefit of the fan-like abutment of land, on the north face of Greenland, to check the ice in the course of its southern or equatorial drift, thus obviating the great drawback of Parry in his attempt to reach the Pole by the Spitzbergen Sea.

"(4) Animal life to sustain travelling parties.

"(5) The co-operation of the Esquimaux; settlements of these people having been found as high as Whale Sound, and probably extending still farther along the coast.

"We were to pass up Baffin's Bay, therefore, to its


LINCOLN SEA
GRANT LAND
HALL LAND
GRINNELL LAND
WASHINGTON LAND
SMITH SOUND
INGLEFIELD LAND
ELLESMERE LAND
PRUDHOE LAND
HAYES PENINSULA
North Water
Black Cape
Hell Gate
Bessels Bay
Humboldt Glacier
Cape Faraday
Clarence Hd.
Cape Isabella
Cape Alexander
Cape Sabine
Cape Tyson
Cape Parry
Cape Lieber
Cape Hawks
Cape Frazer
Cape Parker
Cape Louis Napoleon
Cape Albert
Cape Hotham
Cape Rawlinson
Cape Sumner
Cape Bryant
Cape Isabella
Cape Faraday
Cape Clarence
Cape Lyon

most northern attainable point; and thence, pressing on toward the Pole as far as boats or sledges could carry us, examine the coast-lines for vestiges of the lost party."

Kane left New York on the 30th May 1853, in the *Advance*, a "hermaphrodite brig of 144 tons." The entire party numbered eighteen. At Fiskernaes, Greenland, he engaged Hans Christian, aged nineteen, as an Esquimaux hunter.

The pack was encountered in Melville Bay on 28th July, and Kane was fortunate in passing through to the North Water by 4th August. Smith Sound was entered on 7th August. A boat with a stock of provisions was buried at the north-east point of Littleton Island, and a cairn was erected on the western cape. About 40 miles north of Littleton Island the ice was met, and the *Advance* was forced into Refuge Harbour. After a great deal of warping, the brig reached Rensselaer Harbour in latitude 78° 37′.

When Kane attained the latitude of 78° 41′, he made a curious observation. He states: "We are farther north than any of our predecessors, except Parry on his Spitzbergen foot-tramp." This was far from the truth. Much higher latitudes had been reached centuries before. In the seventeenth century both the English and Dutch had reached a higher latitude in the Spitzbergen Sea: Tschitschagoff in 1765 reached 80° 21′; Phipps in 1773 reached 80° 37′; and Scoresby in 1806 reached 81° 12′ 42″. Had Kane's statement been confined to the route between Greenland and America, it would have been correct, but referring as he did to Parry's Spitzbergen voyage, he was entirely astray.

When Smith Sound was reached, Kane had more than fifty dogs, but many of them soon died. Preparations for the winter were made without delay: a storehouse was

formed on a small island in the harbour; an observatory was built on another island; and a deck-house was made to protect the *Advance*.

Arrangements were then made to form provision-dépôts along the Greenland coast for the purpose of northern exploration. The first dépôt party left on the 20th of September, and returned on the 15th of October. On the 25th of September this party reached Cape Russell, where the first cache of pemmican, together with some bread and alcohol for fuel, was made. A second cache was made at Cape Bonsall, about 30 miles to the north-east of the first dépôt. They reached their highest latitude, 79° 50′, on 6th October. A third cache was placed on a low island near the Humboldt Glacier.

A sunless winter of one hundred and forty days now closed upon them. The influence of the long, intense darkness was found most depressing. Most of the dogs died during this winter from convulsions. The temperature went down to as low as 68° F. below zero during February. The dreadful scurvy made its appearance, and by the middle of March only two members of the party were free of it. The supplies of the expedition were found to be altogether inadequate, both as regard provisions and fuel. On the 19th of March 1854, the first spring party left the brig, with the object of forming more dépôts. The temperature was about 40° F. below zero. On 31st March three of this party made their appearance at the brig unexpectedly. Kane graphically describes the incident: "They were swollen and haggard, and hardly able to speak. Their story was a fearful one. They had left their companions in the ice, risking their own lives to bring us the news: Brooks, Baker, Wilson, and Pierre were all lying frozen and disabled. Where? They could not tell: somewhere in among the hummocks to

the north and east: it was drifting heavily round them when they parted. Irish Tom had stayed by to feed and care for the others; but the chances were sorely against them. It was in vain to question them further. They had evidently travelled a great distance, for they were sinking with fatigue and hunger, and could hardly be rallied enough to tell us the direction in which they had come. My first impulse was to move on the instant with an unencumbered party: a rescue, to be effective or even hopeful, could not be too prompt. What pressed on my mind most was, where the sufferers were to be looked for among the drifts. Ohlsen seemed to have his faculties rather more at command than his associates, and I thought that he might assist us as a guide; but he was sinking with exhaustion, and if he went with us we must carry him. There was not a moment to be lost. While some were still busy with the newcomers and getting ready a hasty meal, others were rigging out the 'Little Willie' with a buffalo-cover, a small tent, and a package of pemmican; and, as soon as we could hurry through our arrangements, Ohlsen was strapped on in a fur bag, his legs wrapped in dog-skins and eider-down, and we were off upon the ice. Our party consisted of nine men and myself. We carried only the clothes on our backs. The thermometer stood at $-46°$, 78 degrees below the freezing-point. A well-known peculiar tower of ice, called by the men the 'Pinnacly Berg,' served as our first landmark: other icebergs of colossal size, which stretched in long beaded lines across the bay, helped to guide us afterward; and it was not until we had travelled for sixteen hours that we began to lose our way. We knew that our lost companions must be somewhere in the area before us, within a radius of 40 miles. Mr. Ohlsen, who had been for fifty hours without rest, fell asleep as soon as we began to move,

and awoke now with unequivocal signs of mental disturbance. It became evident that he had lost the bearing of the icebergs, which in form and colour endlessly repeated themselves; and the uniformity of the vast field of snow utterly forbade the hope of local landmarks.

"Pushing ahead of the party, and clambering over some rugged ice-piles, I came to a long level floe, which I thought might probably have attracted the eyes of weary men in circumstances like our own. It was a light conjecture; but it was enough to turn the scale, for there was no other to balance it. I gave orders to abandon the sledge, and disperse in search of footmarks. We raised our tent, placed our pemmican in cache, except a small allowance for each man to carry on his person; and poor Ohlsen, now just able to keep his legs, was liberated from his bag. The thermometer had fallen by this time to $-49{\cdot}3^{\circ}$, and the wind was setting in sharply from the north-west. It was out of the question to halt: it required brisk exercise to keep us from freezing. I could not even melt ice for water; and, at these temperatures, any resort to snow for the purpose of allaying thirst was followed by bloody lips and tongue: it burnt like caustic.

"It was indispensable, then, that we should move on, looking out for traces as we went. Yet when the men were ordered to spread themselves, so as to multiply the chances, though they all obeyed heartily, some painful impress of solitary danger, or perhaps it may have been the varying configuration of the ice-field, kept them closing up continually into a single group. The strange manner in which some of us were affected I now attribute as much to shattered nerves as to the direct influence of the cold. Men like McGary and Bonsall, who had stood out our severest marches, were seized with trembling-fits

and short breath; and, in spite of all my efforts to keep up an example of sound bearing, I fainted twice on the snow.

"We had been nearly eighteen hours out without water or food, when a new hope cheered us. I think it was Hans, our Esquimaux hunter, who thought he saw a broad sledge-track. The drift had nearly effaced it, and we were some of us doubtful at first whether it was not one of those accidental rifts which the gales make in the surface-snow. But, as we traced on to the deep snow among the hummocks, we were led to footsteps; and, following these with religious care, we at last came in sight of a small American flag fluttering from a hummock, and lower down a little Masonic banner hanging from a tent-pole hardly above the drift. It was the camp of our disabled comrades: we reached it after an unbroken march of twenty-one hours. The little tent was nearly covered. I was not among the first to come up; but, when I reached the tent-curtain, the men were standing in silent file on each side of it. With more kindness and delicacy of feeling than is often supposed to belong to sailors, but which is almost characteristic, they intimated their wish that I should go in alone. As I crawled in, and, coming upon the darkness, heard before me the burst of welcome gladness that came from the four poor fellows stretched on their backs, and then for the first time the cheer outside, my weakness and my gratitude together almost overcame me. 'They had expected me: they were sure I would come!'

"We were now fifteen souls; the thermometer 75° below the freezing-point; and our sole accommodation a tent barely able to contain eight persons: more than half our party were obliged to keep from freezing by walking outside while the others slept. We could not

halt long. Each of us took a turn of two hours' sleep; and we prepared for our homeward march.

"We took with us nothing but the tent, furs to protect the rescued party, and food for a journey of fifty hours. Everything else was abandoned. Two large buffalo-bags, each made of four skins, were doubled up, so as to form a sort of sack, lined on each side by fur, closed at the bottom, but opened at the top. This was laid on the sledge; the tent, smoothly folded, serving as a floor. The sick, with their limbs sewed up carefully in reindeer-skins, were placed upon the bed of buffalo-robes, in a half-reclining posture; other skins and blanket-bags were thrown above them; and the whole litter was lashed together so as to allow but a single opening opposite the mouth for breathing.

"This necessary work cost us a great deal of time and effort; but it was essential to the lives of the sufferers. It took us no less than four hours to strip and refresh them, and then to embale them in the manner I have described. Few of us escaped without frost-bitten fingers: the thermometer was at 55·6° below zero, and a slight wind added to the severity of the cold.

"It was completed at last, however: all hands stood around; and, after repeating a short prayer, we set out on our retreat. It was fortunate indeed that we were not inexperienced in sledging over the ice. A great part of our track lay among a succession of hummocks; some of them extending in long lines, 15 and 20 feet high, and so uniformly steep that we had to turn them by a considerable deviation from our direct course; others that we forced our way through, far above our heads in height, lying in parallel ridges, with the space between too narrow for the sledge to be lowered into it safely, and yet not wide enough for the runners to cross without the aid of ropes to stay them. These spaces, too,

were generally choked with light snow, hiding the openings between the ice-fragments. They were fearful traps to disengage a limb from, for every man knew that a fracture or a sprain even would cost him his life. Besides all this, the sledge was top-heavy with its load: the maimed men could not bear to be lashed down tight enough to secure them against falling off. Notwithstanding our caution in rejecting every superfluous burden, the weight, including bags and tent, was 1100 pounds.

"And yet our march for the first six hours was very cheering. We made by vigorous pulls and lifts nearly a mile an hour, and reached the new floes before we were absolutely weary. Our sledge sustained the trial admirably. Ohlsen, restored by hope, walked steadily at the leading belt of the sledge-lines; and I began to feel certain of reaching our half-way station of the day before, where we had left our tent. But we were still 9 miles from it, when, almost without premonition, we all became aware of an alarming failure of our energies.

"I was, of course, familiar with the benumbed and almost lethargic sensation of extreme cold; and once, when exposed for some hours in the midwinter of Baffin's Bay, I had experienced symptoms which I compared to the diffused paralysis of the electro-galvanic shock. But I had treated the *sleepy comfort* of freezing as something like the embellishment of romance. I had evidence now to the contrary.

"Bonsall and Morton, two of our stoutest men, came to me, begging permission to sleep: 'they were not cold: the wind did not enter them now: a little sleep was all they wanted.' Presently Hans was found nearly stiff under a drift; and Thomas, bolt upright, had his eyes closed, and could hardly articulate. At last, John Blake threw himself on the snow, and refused to rise. They did not complain of feeling cold; but it was in vain that I

wrestled, boxed, ran, argued, jeered, or reprimanded: an immediate halt could not be avoided.

"We pitched our tent with much difficulty. Our hands were too powerless to strike a fire; we were obliged to do without water or food. Even the spirits (whisky) had frozen at the men's feet, under all the coverings. We put Bonsall, Ohlsen, Thomas, and Hans, with the other sick men, well inside the tent, and crowded in as many others as we could. Then, leaving the party in charge of Mr. McGary, with orders to come on after four hours' rest, I pushed ahead with William Godfrey, who volunteered to be my companion. My aim was to reach the half-way tent, and thaw some ice and pemmican before the others arrived.

"The floe was of level ice, and the walking excellent. I cannot tell how long it took us to make the 9 miles; for we were in a strange sort of stupor, and had little apprehension of time. It was probably about four hours. We kept ourselves awake by imposing on each other a continued articulation of words; they must have been incoherent enough. I recall these hours as among the most wretched I have ever gone through: we were neither of us in our right senses, and retained a very confused recollection of what preceded our arrival at the tent. We both of us, however, remember a bear, who walked leisurely before us and tore up as he went a jumper that Mr. McGary had improvidently thrown off the day before. He tore it into shreds and rolled it into a ball, but never offered to interfere with our progress. I remember this, and with it a confused sentiment that our tent and buffalo-robes might probably share the same fate. Godfrey, with whom the memory of this day's work may atone for many faults of a later time, had a better eye than myself; and, looking some miles ahead, he could see that our tent was undergoing the same unceremonious treatment. I

thought I saw it too, but we were so drunken with cold that we strode on steadily, and, for aught I know, without quickening our pace.

"Probably our approach saved the contents of the tent; for when we reached it the tent was uninjured, though the bear had overturned it, tossing the buffalo-robes and pemmican into the snow: we missed only a couple of blanket-bags. What we recollect, however, and perhaps all we recollect, is, that we had great difficulty in raising it. We crawled into our reindeer sleeping-bags, without speaking, and for the next three hours slept on in a dreamy but intense slumber. When I awoke, my long beard was a mass of ice, frozen fast to the buffalo-skin: Godfrey had to cut me out with his jack-knife. Four days after our escape, I found my woollen comfortable with a goodly share of my beard still adhering to it.

"We were able to melt water and get some soup cooked before the rest of our party arrived: it took them but five hours to walk the 9 miles. They were doing well, and, considering the circumstances, in wonderful spirits. The day was most providentially windless, with a clear sun. All enjoyed the refreshment we had got ready: the crippled were repacked in their robes; and we sped briskly toward the hummock-ridges which lay between us and the Pinnacly Berg.

"The hummocks we had now to meet came properly under the designation of squeezed ice. A great chain of bergs stretching from north-west to south-east, moving with the tides, had compressed the surface-floes; and rearing them up on their edges, produced an area more like the volcanic pedragal of the basin of Mexico than anything else I can compare it to.

"It required desperate efforts to work our way over it,—literally desperate, for our strength failed us anew, and we began to lose our self-control. We could not abstain any

longer from eating snow: our mouths swelled, and some of us became speechless. Happily the day was warmed by a clear sunshine, and the thermometer rose to $-4°$ in the shade: otherwise we must have frozen.

"Our halts multiplied, and we fell half sleeping on the snow. I could not prevent it. Strange to say, it refreshed us. I ventured upon the experiment myself, making Riley wake me at the end of three minutes; and I felt so much benefited by it that I timed the men in the same way. They sat on the runners of the sledge, fell asleep instantly, and were forced to wakefulness when their three minutes were out.

"By eight in the evening we emerged from the floes. The sight of the Pinnacly Berg revived us. Brandy, an invaluable resource in emergency, had already been served out in tablespoonful doses. We now took a longer rest, and a last stouter dram, and reached the brig at 1 p.m., we believe without a halt.

"I say *we believe*; and here perhaps is the most decided proof of our sufferings: we were quite delirious, and had ceased to entertain a sane apprehension of the circumstances about us. We moved on like men in a dream. Our footmarks seen afterward showed that we had steered a bee-line for the brig. It must have been by a sort of instinct, for it left no impress on the memory. Bonsall was sent staggering ahead, and reached the brig, God knows how, for he had fallen repeatedly at the track-lines; but he delivered with punctilious accuracy the messages I had sent by him to Dr. Hayes. I thought myself the soundest of all, for I went through all the formula of sanity, and can recall the muttering delirium of my comrades when we got back into the cabin of our brig. Yet I have been told since of some speeches and some orders too of mine, which I should have remembered for their absurdity if my mind had retained its balance.

"Petersen and Whipple came out to meet us about 2 miles from the brig. They brought my dog-team, with the restoratives I had sent for by Bonsall. I do not remember their coming. Dr. Hayes entered with judicious energy upon the treatment our condition called for, administering morphine freely, after the usual frictions. He reported none of our brain-symptoms as serious, referring them properly to the class of those indications of exhausted power which yield to generous diet and rest. Mr. Ohlsen suffered some time from strabismus and blindness; two others underwent amputation of parts of the foot, without unpleasant consequences; and two died in spite of all our efforts. This rescue party had been out for seventy-two hours. We had halted in all eight hours, half of our number sleeping at a time. We travelled between 80 and 90 miles, most of the way dragging a heavy sledge. The mean temperature of the whole time, including the warmest hours of three days, was at $-41{\cdot}2°$. We had no water except at our two halts, and were at no time able to intermit vigorous exercise without freezing."

About the beginning of April 1854, Esquimaux made their appearance. For some time they caused trouble through stealing everything they could. Great tact was necessary in dealing with them, but this Dr. Kane possessed, and he was ultimately successful in making them close friends.

On 25th April, the advance party of the next sledging expedition left the brig, and was joined later by Dr. Kane. Deep snow was encountered, and several of the party began to show signs of the dreaded scurvy. A cache of provisions on which they intended to rely was found to have been almost entirely destroyed by bears. Dr. Kane himself became ill, and the whole party had to return when in the neighbourhood of the great glacier of

Humboldt. They cached some of their stores, and an india-rubber boat, near Dallas Bay, in lat. 79·5°, long. 66°.

On the 20th May another sledge-party was sent off, and consisted of Dr. Hayes and William Godfrey. They were to cross Smith's Straits above the inlet and make as near as possible a straight course for Cape Sabine. This they accomplished with great difficulty, and proceeded north on the ice along the west coast as far as latitude 79° 45′. They then returned south as far as Cape Sabine, and recrossed the straits, arriving at the brig on 1st June. This was a remarkable journey. The equipment was as follows:—a light sledge and team of seven dogs, 80 lb. of pemmican, 16 lb. of bread, 18 lb. of lard and rope-yarn for fuel; a reindeer-skin sleeping-bag for each, a lamp and pot for cooking, sextant, pocket-compass, telescope, Sharpe's rifle, two extra pairs of stockings and one of boots for each. About the third day Dr. Hayes suffered from snow-blindness, and this caused some delay. The dogs' harness lines had to be frequently repaired, which could only be done ultimately by cutting strips from Godfrey's seal-skin trousers. Great hummocks of ice from 20 to 40 feet in height were encountered. In crossing these ridges the sledge frequently capsized and rolled over and over, dogs, cargo, and all. In twelve days a distance not less than 400 miles was covered; the last day's travel, when provisions ran short, was 70 miles.

Dr. Kane had not completed the entire circuit of the frozen waters of Smith Sound. He could not yet say whether it was landlocked or whether a channel existed still farther to the north. This he determined to discover. McGary, Bonsall, Hickey, and Riley were detailed for the first section of the new parties. They were accompanied by Morton, who had orders to keep himself

as fresh as possible, so as to enter on his farthest north reach in the best possible condition.

They left the vessel on the 4th of June, and made for the Humboldt Glacier. Here Morton was joined by Hans with the dog-sledge, and the two set out on the 18th June, pursuing a northerly course nearly parallel with the glacier, and from 4 to 7 miles distant from it, according to the condition of the ice. The icebergs given off by the glacier presented great difficulties, but these were finally overcome. On the 21st of June, Kennedy Channel was sighted, and they directed their course towards the cape at the eastern side of the entrance—Cape Andrew Jackson. Here they found open water, and it was with great difficulty that the cape was rounded. Still proceeding north, they reached Cape Constitution in latitude 81° 22′. An attempt to pass this cape failed. Morton climbed up the cliff to a height of 500 feet, and could get no farther. As far as he could see not a speck of ice was visible. He stated: "As far as I could discern, the sea was open, a swell coming in from the northward and running crosswise, as if with a small eastern set. The wind was due north—enough of it to make white caps—and the surf broke in on the rocks below in regular breakers. The sky to the north-west was of dark rain-cloud, the first that I had seen since the brig was frozen up. Ivory gulls were nesting in the rocks above me, and out to sea were mollemoke and silver-backed gulls. The ducks had not been seen north of the first island of the channel, but petrel and gulls hung about the waves near the coast."

Morton was absent on this journey thirty days. The open condition of Kennedy Channel, discovered by him, had a most important bearing on some of the expeditions which followed Kane's. It gave strong support to the theory of an open polar sea, which was believed in by many until the British Expedition of 1875. Dr. Kane

himself wavered between the arguments for and against. He, however, was aware of the fact that open water, which had frequently been described as a polar sea, had been found by many explorers in various parts of the Arctic regions, which on further investigation was found to be merely temporary. And Dr. Kane, after referring to this fact, wrote: "All these illusory discoveries were no doubt chronicled with perfect integrity; and it may seem to others, as since I have left the field it sometimes does to myself, that my own, though on a larger scale, may one day pass within the same category."

All the sledge-parties had now returned to the brig, and the season of Arctic travel had ended. The question now to be faced was how they were to pass a second winter in the event of the ice not liberating the brig, which seemed likely. As Dr. Kane remarked, "there never was, and I trust never will be, a party worse armed for the encounter of a second Arctic winter. We have neither health, fuel, nor provisions."

He first determined to examine the condition of the ice to the south. He found that for 35 miles the straits were absolutely tight. He then resolved to make an attempt to communicate with Beechy Island and obtain assistance from Sir Edward Belcher's squadron, which was in search of Franklin in Wellington Channel. A whale-boat was mounted on a sledge, and Kane with five of his men started off on the tremendous undertaking. On some rocky islets near Littleton Island over 200 eider ducks were killed in a few hours. They ultimately reached within 10 miles of Cape Parry, but were stopped there by a solid mass of ice. They returned to Northumberland Island, and obtained an abundance of auks and eiders. The ice still remaining solid, they decided to return to the brig. There was still no sign of the ice breaking up. On 15th August, Dr. Kane wrote: "The

season travels on: the young ice grows thicker, and my messmates' faces grow longer, every day. I have again to play buffoon to keep up the spirits of the party." On the 18th of August the amount of wood was reduced to 6 lb. a meal. A suggestion was now made by some of the party that an effort should be made to reach the Danish settlements. On 24th August, Dr. Kane called all hands and frankly explained his reasons which determined him to remain with the brig. He gave his permission, however, to such as were desirous of making the attempt to reach the settlements to do so. Eight men decided to remain with Dr. Kane. The others received a liberal share of the resources, and left the brig on 28th August. One of this party — George Riley—returned a few days afterwards. Dr. Kane now took steps to make the brig as warm as possible in view of the fact that there was little fuel left. Moss and turf were collected with which the quarter-deck was well padded. A space about 18 feet square was enclosed below, and this was packed from floor to ceiling with inner walls of the same material. The floor was covered 2 inches deep with oakum, on the top of which was placed a canvas carpet. The entrance to this space was from the hold by a low moss-lined tunnel. The whole arrangement was an imitation of the igloë of the Esquimaux. The outer-deck planking of the brig was now stripped off and stacked for firewood. On the 11th September the stock of game consisted of six long-tailed ducks and three ptarmigan.

Soon after this, Dr. Kane started with Hans to try and obtain seal in the open water some distance from the brig. Seal were sighted, but before they could be reached the ice became thin and dangerous. An attempt was made to reach a solid floe, but when within 50 paces from it, the sledges broke through. What followed is best described in Dr. Kane's own words: "My first thought

was to liberate the dogs. I leaned forward to cut poor Tood's traces, and the next minute was swimming in a little circle of pasty ice and water alongside him. Hans, dear good fellow, drew near to help me, uttering piteous expressions in broken English; but I ordered him to throw himself on his belly, with his hands and legs extended, and to make for the island by cogging himself forward with his jack-knife. In the meantime—a mere instant—I was floundering about with sledge, dogs, and lines, in confused puddle around me. I succeeded in cutting poor Tood's lines and letting him scramble to the ice, for the poor fellow was drowning me with his piteous caresses, and made my way for the sledge; but I found that it would not buoy me, and that I had no resource but to try the circumference of the hole. Around this I paddled faithfully, the miserable ice always yielding when my hopes of a lodgement were greatest. During this process I enlarged my circle of operations to a very uncomfortable diameter, and was beginning to feel weaker after every effort. Hans meanwhile had reached the firm ice, and was on his knees, like a good Moravian, praying incoherently in English and Esquimaux; at every fresh crushing-in of the ice he would ejaculate 'God!' and when I recommenced my paddling he recommenced his prayers.

"I was nearly gone. My knife had been lost in cutting out the dogs; and a spare one which I carried in my trousers-pocket was so enveloped in the wet skins that I could not reach it. I owed my extrication at last to a newly broken team-dog who was still fast to the sledge, and in struggling carried one of the runners chock against the edge of the circle. All my previous attempts to use the sledge as a bridge had failed, for it broke through, to the much greater injury of the ice. I felt that it was a last chance. I threw myself on my back, so as to lessen as

much as possible my weight, and placed the nape of my neck against the rim or edge of the ice; then with caution slowly bent my leg, and, placing the ball of my moccasined foot against the sledge, I pressed steadily against the runner, listening to the half-yielding crunch of the ice beneath.

"Presently I felt that my head was pillowed by the ice, and that my wet fur jumper was sliding up the surface. Next came my shoulders; they were fairly on. One more decided push, and I was launched up on the ice, and safe."

On 5th October the stock of fresh meat consisted of one rabbit and three ducks. On the 7th they were fortunate in killing a bear.

Darkness was now creeping in on them, and some remarks of Kane on the Arctic night are well worth quoting: "The intense beauty of the Arctic firmament can hardly be imagined. It looked close above our heads, with its stars magnified in glory, and the very planets twinkling so much as to baffle the observations of our astronomer. I am afraid to speak of some of these night-scenes. I have trodden the deck and the floes, when the life of earth seemed suspended, its movements, its sounds, its colouring, its companionships; and as I looked on the radiant hemisphere, circling above me as if rendering worship to the unseen Centre of light, I have ejaculated in humility of spirit, 'Lord, what is man that Thou art mindful of him?' And then I have thought of the kindly world we had left, with its revolving sunshine and shadow; and the other stars that gladden it in their changes, and the hearts that warmed to us there; till I lost myself in memories of those who are not;—and they bore me back to the stars again."

By the beginning of December, scurvy was making sad inroads among the party. On the 2nd, Dr. Kane wrote:

"Had to put Mr. McGary and Riley under active treatment for scurvy. Gums retracted, ankles swollen, and bad lumbago. Mr. Wilson's case, a still worse one, has been brought under. Morton's is a saddening one: I cannot afford to lose him. He is not only one of my most intelligent men, but he is daring, cool, and everyway trustworthy. His tendon Achilles has been completely perforated, and the surface of the heel-bone exposed. An operation in cold, darkness, and privation would probably bring on locked-jaw. Brooks grows discouraged: the poor fellow has scurvy in his stump, and his leg is drawn up by the contraction of the flexors at the knee-joint. This is the third case on board—the fourth if I include my own—of contracted tendons."

On the 7th of December, Bonsall and Petersen, two of the party that left Kane on 28th August, returned to the brig, and the remainder of the party arrived on the 12th. They had gone through a terrible trial. When they arrived at the brig, the thermometer was at -50°; they were covered with rime and snow, and were fainting with hunger. They had journeyed 350 miles, and their last run from the bay near Etah, some 70 miles in a straight line, was through the hummocks at this appalling temperature. For more than two months they had lived on frozen seal and walrus-meat.

Food for the whole party became more and more scarce, and Dr. Kane determined to make a journey to Etah in order to obtain assistance from the Esquimaux, if possible. His views on sledging at this period are interesting: "My plans for sledging, simple as I once thought them, and simple certainly as compared with those of the English parties, have completely changed. Give me an 8 lb. reindeer-fur bag to sleep in, an Esquimaux lamp with a lump of moss, a sheet-iron snow-melter or a copper soup-pot, with a tin cylinder to slip

over it and defend it from the wind, a good *pièce de résistance* of raw walrus-beef; and I want nothing more for a long journey, if the thermometer will keep itself as high as minus 30°. Give me a bear-skin bag and coffee to boot; and with the clothes on my back I am ready for minus 60°,—but no wind.

"The programme runs after this fashion. Keep the blood in motion, without loitering on the march: and for the halt, raise a snow-house; or if the snow lie scant or impracticable, ensconce yourself in a burrow or under the hospitable lee of an inclined hummock-slab. The outside fat of your walrus sustains your little moss fire: its frozen slices give you bread, its frozen blubber gives you butter, its scrag ends make the soup. The snow supplies you with water; and when you are ambitious of coffee there is a bagful stowed away in your boot. Spread out your bear-bag, your only heavy movable; stuff your reindeer-bag inside, hang your boots up outside, take a blade of bone, and scrape off all the ice from your furs. Now crawl in, the whole party of you, feet foremost; draw the top of your dormitory close, heading to leeward. Fancy yourself in Sybaris; and, if you are only tired enough, you may sleep—like St. Lawrence on his grid-iron, or even a trifle better."

On 17th January 1855, Dr. Kane wrote: "There is no evading it any longer: it has been evident for the past ten days that the present state of things cannot last. We require meat, and cannot get along without it. Our sick have finished the bear's head, and are now eating the condemned abscessed liver of the animal, including some intestines that were not given to the dogs. We have about three days' allowance; thin chips of raw frozen meat, not exceeding 4 oz. in weight for each man per day."

On 22nd January, Kane and Hans left the brig to make

an attempt to reach Etah. Unfortunately, a severe snow-storm came on soon after they reached a half-way hut. After being storm-bound two days, they attempted to push on, but found that the snow had accumulated to such an extent that it was impossible to complete the journey. They returned to the hut, and next day tried the land ice, but in vain. Kane, however, climbed a hill from which he discovered a trough through the hummock-ridges, and level plains of ice stretching to the south. Had the dogs not been disabled and the moonlight waning, they could now have made the journey; but as it was, they were forced to return to the brig, which they reached thoroughly exhausted.

Petersen and Hans started on 3rd February to make another attempt. They returned on the 5th, having found that the snow had become impassable. At this time only five of the party were able to work, and even these were not free from scurvy. On 28th February Kane had to report: "The scurvy is steadily gaining on us. I do my best to sustain the more desperate cases; but as fast as I partially build up one, another is stricken down. The disease is perhaps less malignant than it was, but it is more diffused throughout our party. Except William Morton, who is disabled by a frozen heel, not one of our eighteen is exempt. Of the six workers of our party, as I counted them a month ago, two are unable to do outdoor work, and the remaining four divide the duties of the ship among them. Hans musters his remaining energies to conduct the hunt. Petersen is his disheartened, moping assistant. The other two, Bonsall and myself, have all the daily offices of household and hospital. We chop five large sacks of ice, cut 6 fathoms of 8-inch hawser into junks of a foot each, serve out the meat when we have it, hack at the molasses, and hew out with crowbar and axe the pork and dried apples, pass

up the foul slop and cleansings of our dormitory; and in a word, cook, *scullionise*, and attend the sick. Added to this, for five nights running I have kept watch from 8 p.m. to 4 a.m., catching cat-naps as I could in the day without changing my clothes, but carefully waking every hour to note thermometers."

Such was the stuff of which Dr. Kane was made!

On the 6th of March, Kane made the desperate venture of sending Hans, the only effective huntsman, on a sledge-journey to find the Esquimaux of Etah. He took with him the two surviving dogs in the lightest sledge. He returned on the 10th, having made the journey successfully. He found that the plight of the Esquimaux, so far as food was concerned, had been worse than those at the brig. Hans, however, assisted in a walrus-hunt, and with his rifle succeeded in killing a walrus. With his share of the meat he returned to the brig, where he was heartily welcomed.

By the end of March, Kane was able to hope that the scurvy was abating. In his journal on 3rd April, he gives a description of the daily routine:—

"At 7.30 call 'all hands'; which means that one of the well trio wakes the other two. This order is obeyed slowly. The commander confesses for himself that the breakfast is well-nigh upon table before he gets his stiff ankles to the floor. Looking around, he sees the usual mosaic of sleepers as ingeniously dovetailed and crowded together as the campers-out in a buffalo-bag. He winds his way through them, and, as he does so, some stereotyped remarks are interchanged. 'Thomas!'—our ex-cook, now side by side with the first officer of the expedition,—'Thomas, turn out!' 'Eugh-ng, sir.' 'Turn out; get up.' 'Ys-sir;' (sits bolt upright and rubs his eyes.) 'How d'you feel, Mr. Ohlsen?' 'Better, sir.' 'How've you passed the night, Mr. Brooks?' 'Middlin', sir.'

And, after a diversified series of spavined efforts, the mystical number forms its triangle at the table.

"It still stands in its simple dignity, an unclothed platform of boards, with a pile of plates in the centre. Near these is a virtuoso collection of cups grouped in a tumulus or cairn, commencing philosophically at the base with heavy stoneware, and ending with battered tin: the absolute pinnacle a debased dredging-box, which makes a bad goblet, being unpleasantly sharp at its rim. At one end of this table, partly hid by the beer-barrel, stands Petersen; at the side, Bonsall; and a lime-juice cask opposite marks my seat. We are all standing: a momentary hush is made among the sick; and the daily prayer comes with one heart:—'Accept our gratitude, and restore us to our homes.'

"The act of devotion over, we sit down, and look—not at the breakfast, but at each other.

"It may sound absurd to those who cannot understand the narrowing interest which we three availables feel in our continued mutual ability, for me to say that we spend the first five minutes in a detail of symptoms. The state of each man's gums and shins and ankles, his elbows, loins, and kidneys, is canvassed minutely and compared with his yesterday's report: the recital might edify a specialist who was anxious to register the Protean indications of scurvy. It is sometimes ludicrous, but always sad.

"Now for the bill of fare. 'Who cooked?'—I am describing a gala-day.—'It was Morton: he felt so much better that he got up at six; but he caved in soon after':—

"First, coffee, great comforter to hard-worked men; one part of the genuine berry to three of navy-beans; next, sugar: what complex memories the word brings back!—the veritable sugar has been long ago defunct; but we have its representative molasses twice a week in our tea. Third, butter; there it is in a mutilated

vegetable-dish; my own invention, melted from salt beef and washed in many waters: the unskilled might call it tallow. Fourth, a real delicacy not to be surpassed in court or camp, for Morton was up to see to it:—a pile of hot rolls of fine Virginia flour. What else? Nothing else: the breakfast resolves itself into bean-coffee, tallow, and hot bread. Yet a cordial meal it is. I am sorry to hurry over it so uncourteously, for I could dwell with Charles Lamb's pensive enthusiasm upon the fleshpots; but I have been longer in describing the feast than it takes us to dispose of it. I hurry on with the interesting detail. Dinner is breakfast, with the beans converted into soup instead of coffee; and supper boasts of stewed apples.

"Work commences at nine. Petersen is off with his gun, and the two remaining dearly beloved Rogers arrange their carte: one makes the round of the sick and deals out their daily allowance of raw meat; the other goes to cutting ice. Those who can sit in bed and work, pick eider-down or cotton, for coverlets to our boat-bedding on the escape; others sew canvas bags for the same purpose; and Brooks balls off twine in order to lay up 'small stuff.'

"At times when the sun comes out very brightly, Brooks and Wilson get permission to go on deck. One of us assists them, and, by the aid of creeping and crawling, these poor cripples manage to sit upon the combings of the hatch and look around in the glorious daylight. The sight seldom fails to affect them. There are emotions among rude, roughly nurtured men which vent themselves in true poetry. Brooks has about him sensibilities that shame me.

"This afternoon, save to the cook, is a season of rest; a real lazy, lounging interval, arrested by the call to supper. The coming night-watch obliges me to take an

evening cat-nap. I state this by way of implying that I never sleep o' daytimes.

"After supper, we have a better state of things than two weeks ago. Then the few tired-out workers were regaled by the groans and tossings of the sick. There was little conversation, and the physiognomy of our smoke-blackened little den was truly dismal. Now daylight pours in from the scuttle, the tea-kettle sings upon the stove, the convalescents rise up on their elbows and spin merry yarns. We are not yet sufficiently jolly for cards; but we are sufficiently thankful to do without them. At nine, silence almost unbroken prevails throughout our dormitory, and the watch-officer slips on his bear-skin, and, full of thoughts of to-morrow, resigns himself to a round of little routine observances, the most worthless of which is this unbroken record of the changing days."

Kane now became convinced that the brig had little chance of being released from the ice, and he began preparations for a retreat by boat to the Danish settlement of Upernavik.

"Canvas moccasins had been made for every one of the party, and three dozen were added as a common stock to meet emergencies. Three pairs of boots were allowed each man. These were generally of carpeting, with soles of walrus and seal hide; and when the supply of these gave out, the leather from the chafing-gear of the brig for a time supplied their place. A much better substitute was found afterward in the gutta-percha that had formed the speaking-tube. This was softened by warm water, cut into lengths, and so made available to its new uses. Blankets were served out as the material for body-clothing: every man was his own tailor. For bedding, the woollen curtains that had formerly decorated our berths supplied us with a couple of large

coverlets, which were abundantly quilted with eider-down. Two buffalo-robes of the same size with the coverlets were arranged so as to button on them, forming sleeping-sacks for the occasion, but easily detached for the purpose of drying or airing.

"Our provision-bags were of assorted sizes, to fit under the thwarts of the boats. They were of sail-cloth made water-tight by tar and pitch, which we kept from penetrating the canvas by first coating it with flour-paste and plaster of Paris. The bread-bags were double, the inner saturated with paste and plaster by boiling in the mixture, and the space between the two filled with pitch. Every bag was, in sailor-phrase, roped and becketed; in ordinary parlance, well secured by cordage.

"These different manufactures had all of them been going on through the winter, and more rapidly as the spring advanced. They had given employment to the thoughts of our sick men, and in this way had exerted a wholesome influence on their moral tone and assisted their convalescence. Other preparations had been begun more recently. The provisions for the descent were to be got ready and packed. The ship-bread was powdered by beating it with a capstan-bar, and pressed down into the bags which were to carry it. Pork-fat and tallow were melted down, and poured into other bags to freeze. A stock of concentrated bean-soup was cooked, and secured for carriage like the pork-fat; and the flour and remaining meat-biscuit were to be protected from moisture in double bags. These were the only provisions we were to carry with us. I knew I should be able to subsist the party for some time after their setting out by the food I could bring from the vessel by occasional trips with my dog-team. For the rest, we relied upon our guns.

"Besides all this, we had our camp equipage to get in

order, and the vitally important organisation of our system of boats and sledges.

"Our boats were three in number, all of them well battered by exposure to ice and storm, almost as destructive of their sea-worthiness as the hot sun of other regions. Two of them were cypress whale-boats, 26 feet long, with 7 feet beam, and 3 feet deep. These were strengthened with oak bottom-pieces and a long string-piece bolted to the keel. A wash-board of light cedar, about 6 inches high, served to strengthen the gunwale and give increased depth. A neat housing of light canvas was stretched upon a ridge-line sustained fore and aft by stanchions, and hung down over the boat's sides, where it was fastened (stopped) to a jack-stay. My last year's experience on the attempt to reach Beechy Island determined me to carry but one mast to each boat. It was stepped into an oaken thwart, made especially strong, as it was expected to carry sail over ice as well as water: the mast could be readily unshipped, and carried, with the oars, boat-hooks, and ice-poles, alongside the boat. The third boat was my little *Red Eric*. We mounted her on the old sledge, the *Faith*, hardly relying on her for any purposes of navigation, but with the intention of cutting her up for firewood in case our guns should fail to give us a supply of blubber.

"Indeed, in spite of all the ingenuity of our carpenter, Mr. Ohlsen, well seconded by the persevering labours of McGary and Bonsall, not one of our boats was positively sea-worthy. The planking of all of them was so dried up that it could hardly be made tight by caulking.

"The three boats were mounted on sledges rigged with rue-raddies; the provisions stowed snugly under the thwarts; the chronometers, carefully boxed and padded, placed in the stern-sheets of the *Hope*, in

charge of Mr. Sonntag. With them were such of the instruments as we could venture to transport. They consisted of two Gambey sextants with artificial horizon, our transit-unifilar, and dip-instruments. Our glasses, with a few of the smaller field-instruments, we carried on our persons. Our fine theodolite we were forced to abandon. Our powder and shot, upon which our lives depended, were carefully distributed in bags and tin canisters. The percussion caps I took into my own possession, as more precious than gold. Mr. Bonsall had a general charge of the arms and ammunition. Places were arranged for the guns, and hunters appointed for each boat. Mr. Petersen took charge of the most important part of our field equipage, our cooking-gear. Petersen was our best tinker. All the old stove-pipe, now none the better for two winters of Arctic fires, was called into requisition. Each boat was provided with two large iron cylinders, 14 inches in diameter and 18 inches high. Each of them held an iron saucer or lamp, in which we could place our melted pork-fat or blubber, and, with the aid of spun-yarn for a wick, make a roaring fire. I need not say that the fat and oil always froze when not ignited. Into these cylinders, which were used merely to defend our lamp from the wind and our pots from contact with the cold air, we placed a couple of large tin vessels, suitable either for melting snow or making tea or soup. They were made out of cake-canisters cut down. How many kindly festival associations hung by these now abused soup-cans! one of them had, before the fire rubbed off its bright gilding, the wedding-inscription of a large fruit-cake.

"We carried spare tins in case the others should burn out: it was well we did so. So completely had we exhausted our household furniture, that we had neither cups nor plates, except crockery. This, of course, would

not stand the travel, and our spare tin had to be saved for protecting the boats from ice. At this juncture we cut plates out of every imaginable and rejected piece of tinware. Borden's meat-biscuit canisters furnished us with a splendid dinner-service; and some rightly feared tin jars, with ominous labels of Corrosive Sublimate and Arsenic, which once belonged to our department of Natural History, were emptied, scoured, and cut down into tea-cups."

The 17th of May was fixed as the date of setting out, and each man was to be allowed 8 lb. of personal effects. Until the boats were hauled a considerable distance from the brig, the party returned to it at night. When the last farewell to the brig was made, the entire ship's company took part in the ceremonial. It is best described in Dr. Kane's own words:—

"We read prayers and a chapter of the Bible; and then, all standing silently round, I took Sir John Franklin's portrait from its frame and cased it in an india-rubber scroll. I next read the reports of inspection and survey which had been made by the several commissions organised for the purpose, all of them testifying to the necessities under which I was about to act. I then addressed the party: I did not affect to disguise the difficulties that were before us; but I assured them that they could all be overcome by energy and subordination to command, and that the 1300 miles of ice and water that lay between us and North Greenland could be traversed with safety for most of us, and hope for all. I added that as men and messmates it was the duty of us all, enjoined by gallantry as well as religion, to postpone every consideration of self to the protection of the wounded and sick; and that this must be regarded by every man and under all circumstances as a paramount order. In conclusion, I told them to think over the trials

we had all of us gone through, and to remember each man for himself how often an unseen Power had rescued him in peril, and I admonished them still to place reliance on Him who could not change."

On reaching the boats, the party were regularly mustered and divided between the two. A rigid inspection was made of every article of personal equipment. Each man had a woollen under-dress and an Esquimaux suit of fur clothing—kapetah, nessak, and nannooke complete, with boots of their own make. One pair of boots was made of canvas faced with walrus-hide, and another inside these made of the cabin Brussels carpet. In addition to this, each man carried a rue-raddy—a shoulder-belt to drag by—adjusted to fit him comfortably, a pair of socks next his skin, and a pair of large goggles for snow-blindness, made Esquimaux-fashion by cutting a small slit in a piece of wood. The provision-bags and other stores were numbered, and each man and officer had his own bag and a place assigned for it, to prevent confusion in rapid stowing and unstowing. Excluding four sick men, who were unable to move, and Dr. Kane, who had to drive the dog-team and serve as common carrier and courier, they numbered but twelve men, which would have given six to a sledge—too few to move it. It was therefore necessary to concentrate the entire force upon one sledge at a time.

The routine established by Dr. Kane was the most precise:—"Daily prayers both morning and evening, all hands gathering round in a circle and standing uncovered during the short exercise; regulated hours; fixed duties and positions at the track-lines and on the halt; the cooking to be taken by turns, the captains of the boats alone being excused. The charge of the log was confided to Dr. Hayes, and the running survey to Mr. Sonntag. The thermometer was observed every three hours."

Dr. Kane prepared the hut at Anoatok for the reception of the sick, and carried a large part of the provisions there. During the first fortnight after the sledges left the brig he journeyed between 700 and 800 miles in doing this work by means of his dog-sledge—a mean travel of about 57 miles a day.

Before reaching open water on the 16th of June, enormous difficulties had to be overcome, and one man lost his life through an injury to his back in making an attempt to keep one of the sledges from going through the ice.

The boats had now to be caulked and swelled to prepare them for a long and adventurous navigation.

Nearly the whole Esquimaux settlement followed and assisted them as far as the open water, and Dr. Kane thus describes the scene near the time of bidding them farewell:—

"Each one has a knife, or a file, or a saw, or some such treasured keepsake; and the children have a lump of soap, the greatest of all great medicines. The merry little urchins break in upon me even now as I am writing:—'Kuyanake, kuyanake, Nalegaksoak!' 'Thank you, thank you, big chief!' while Myouk is crowding fresh presents of raw birds on me as if I could eat for ever, and poor Aningnah is crying beside the tent-curtain, wiping her eyes on a bird-skin!

"My heart warms to these poor, dirty, miserable, yet happy beings, so long our neighbours, and of late so staunchly our friends. Theirs is no affectation of regret. There are twenty-two of them around me, all busy in good offices to the Docto Kayens; and there are only two women and the old blind patriarch Kresuk, 'Driftwood,' left behind at the settlement.

"But see! more of them are coming up,—boys ten years old are pushing forward babies on their sledges. The

whole nation is gipsying with us upon the icy meadows.

"We cook for them in our big camp-kettle; they sleep in the *Red Eric*; a berg close at hand supplies them with water; and thus, rich in all that they value,—sleep and food and drink and companionship,—with their treasured short-lived summer sun above them, the *beau ideal* and sum of Esquimaux blessings, they seem supremely happy.

"Poor creatures! It is only six months ago that starvation was among them: many of the faces around me have not yet lost the lines of wasting suspense. The walrus-season is again of doubtful productiveness, and they are cut off from their brethren to the south, at Netelik, and Appah, until winter rebuilds the avenue of ice. With all this, no thoughts of the future cross them. Babies squall, and women chatter, and the men weave their long yarns with peals of rattling hearty laughter between.

"Ever since we reached Pekiutlik, these friends of ours have considered us their guests. They have given us hand-sledges for our baggage, and taken turn about in watches to carry us and it to the water's edge. But for them our dreary journey would have been prolonged at least a fortnight, and we are so late even now that hours may measure our lives. Metek, Myouk, Nessark, Erkee, and the half-grown boys have been our chief labourers; but women, children, and dogs are all bearing their part

"Whatever may have been the faults of these Esquimaux heretofore, stealing was the only grave one. Treachery they may have conceived; and I have reason to believe that, under superstitious fears of an evil influence from our presence, they would at one time have been glad to destroy us. But the day of all this has passed away. When trouble came to us and to them, and

we bent ourselves to their habits,—when we looked to them to procure us fresh meat, and they found at our poor Oomiak-soak shelter and protection during their wild bear-hunts,—then we were so blended in our interests as well as modes of life that every trace of enmity wore away. God knows that since they professed friendship, albeit the imaginary powers of the angekok-soak and the marvellous six-shooter which attested them may have had their influence, never have friends been more true. Although, since Ohlsen's death, numberless articles of inestimable value to them have been scattered upon the ice unwatched, they have not stolen a nail. It was only yesterday that Metek, upon my alluding to the manner in which property of all sorts was exposed without pilfering, explained through Petersen, in these two short sentences, the argument of their morality:—

"'You have done us good. We are not hungry; we will not take, (steal)—You have done us good; we want to help you: we are friends.'"

Kane and his men were delayed by a gale till 19th June, when they embarked in three boats. Of the original nineteen men, three had died. Another, Hans Christian the Esquimaux, had fallen in love, and remained behind. The party now, therefore, consisted of fifteen. They made first for Hakluyt Island, where the boats had to undergo further repairs. In the morning of 22nd June, they pushed forward through a snowstorm for Northumberland Island, where a number of auks were secured. Murchison Channel was crossed on 23rd June, and they encamped for the night near the base of Cape Parry. Soon after leaving here they encountered a gale from the north-west, and had great difficulty in escaping from the drifting ice. By good luck, however, they landed at the breeding-grounds of a large number of eider ducks, and were able to gather 1200 eggs a day.

Here they remained three days, until the storm abated. They now made for Cape Dudley Digges, which they reached on 11th July. Here they obtained an abundance of birds, and scurvy grass. The ice ahead barred their passage, and they were nothing loath to spend a week where there was plenty of food. On 18th July they again set out, but in doing so were unfortunate enough to lose their best shot-gun and their kettle, owing to the capsizing of one of the boats. Cape York was reached on 21st July. Here they left the coast-line and entered the ice-pack. On the 28th the daily allowance of food was restricted to 5 oz. of bread-dust, 4 oz. of tallow, and 3 oz. of bird-meat. The *Red Eric* was broken up for fuel, so that the whole party had now to be transported in two boats. The short rations soon began to tell on their strength, and the old symptoms of scurvy came back again. It was at this crisis that a seal was seen, and the incident is thus described by Dr. Kane:—

"It was an ussuk, and so large that I at first mistook it for a walrus. Signal was made for the *Hope* to follow astern, and, trembling with anxiety, we prepared to crawl down upon him.

"Petersen, with the large English rifle, was stationed in the bow, and stockings were drawn over the oars as mufflers. As we neared the animal, our excitement became so intense that the men could hardly keep stroke. I had a set of signals for such occasions which spared us the noise of the voice; and when about 300 yards off, the oars were taken in, and we moved in deep silence with a single scull astern.

"He was not asleep, for he reared his head when we were almost within rifle-shot; and to this day I can remember the hard, careworn, almost despairing expression of the men's thin faces as they saw him move: their lives depended on his capture.

"I depressed my hand nervously, as a signal for Petersen to fire. McGary hung upon his oar, and the boat, slowly but noiselessly sagging ahead, seemed to me within certain range. Looking at Petersen, I saw that the poor fellow was paralysed by his anxiety, trying vainly to obtain a rest for his gun against the cut-water of the boat. The seal rose on his fore-flippers, gazed at us for a moment with frightened curiosity, and coiled himself for a plunge. At that instant, simultaneously with the crack of our rifle, he relaxed his long length on the ice, and, at the very brink of the water, his head fell helpless to one side.

"I would have ordered another shot, but no discipline could have controlled the men. With a wild yell, each vociferating according to his own impulse, they urged both boats upon the floes. A crowd of hands seized the seal and bore him up to safer ice. The men seemed half crazy; I had not realised how much we were reduced by absolute famine. They ran over the floe, crying and laughing and brandishing their knives. It was not five minutes before every man was sucking his bloody fingers or mouthing long strips of raw blubber.

"Not an ounce of this seal was lost. The intestines found their way into the soup-kettles without any observance of the preliminary home-processes. The cartilaginous parts of the fore-flippers were cut off in the mêlée, and passed round to be chewed upon; and even the liver, warm and raw as it was, bade fair to be eaten before it had seen the pot. That night, on the large halting-floe, to which, in contempt of the dangers of drifting, we happy men had hauled our boats, two entire planks of the *Red Eric* were devoted to a grand cooking-fire, and we enjoyed a rare and savage feast.

"This was our last experience of the disagreeable effects of hunger. In the words of George Stephenson,

'The charm was broken and the dogs were safe.' The dogs I have said little about, for none of us liked to think of them. The poor creatures Toodla and Whitey had been taken with us as last resources against starvation. They were, as McGary worded it, 'meat on the hoof,' and 'able to carry their own fat over the floes.' Once, near Weary Man's Rest, I had been on the point of killing them; but they had been the leaders of our winter's team, and we could not bear the sacrifice."

Within a day or two after killing the large seal, another was shot, and from that time forward they had a full supply of food. On the 1st of August they sighted the Devil's Thumb, and were soon among the Duck Islands. A few days after this they met an Upernavik oil-boat, and received some scanty news of the world. They learnt that a squadron under Captain Hartstene had left for the north in search of them a short time before. On the 6th of August they arrived at Upernavik, where they were well received by the Danes—eighty-three days after leaving the *Advance*. The squadron under Hartstene returned in time to convey Dr. Kane and his party to America.

The results of Dr. Kane's expedition were very important. Ross had declared that Smith Sound was a bay, and although Captain Inglefield in 1852 proved that it was a sound, he reached only 78° 28′. Kane extended our knowledge up to 81° 22′, and all indications tended to show that Kennedy Channel led to the Polar Ocean.

No one can read Kane's book without being impressed by the noble character of the man. He was a hero in the highest sense of the word. It is sad to relate that he died in Havana on the 16th February 1857, when only thirty-seven years of age.

CHAPTER III

EXPEDITION COMMANDED BY DR. HAYES IN 1860–61

The object of Dr. Hayes' expedition may be given in his own words:—

"The plan of the enterprise first suggested itself to me while acting as surgeon of the expedition commanded by the late Dr. E. K. Kane, of the United States Navy. Although its execution did not appear feasible at the period of my return from that voyage in October 1855, yet I did not at any time abandon the design. It comprehended an extensive scheme of discovery. The proposed route was that by Smith Sound. My object was to complete the survey of the north coasts of Greenland and Grinnell Land, and to make such explorations as I might find practicable in the direction of the North Pole.

"My proposed base of operations was Grinnell Land, which I had discovered on my former voyage, and had personally traced beyond latitude 80°, far enough to satisfy me that it was available for my design.

"Accepting the deductions of many learned physicists that the sea about the North Pole cannot be frozen, that an open area of varying extent must be found within the Ice-belt which is known to invest it, I desired to add to the proofs which had already been accumulated by the early Dutch and English voyagers, and, more recently, by the researches of Scoresby, Wrangel, and Parry, and still later by Dr. Kane's expedition.

"It is well known that the great difficulty which has been encountered, in the various attempts that have been made to solve this important physical problem, has been the inability of the explorer to penetrate the Ice-belt with his ship, or to travel over it with sledges sufficiently far to obtain indisputable proof. My former experience led me to the conclusion that the chances of success were greater by Smith Sound than by any other route, and my hopes of success were based upon the expectation which I entertained of being able to push a vessel into the Ice-belt, to about the 80th parallel of latitude, and thence to transport a boat over the ice to the open sea which I hoped to find beyond. Reaching this open sea, if such fortune awaited me, I proposed to launch my boat and to push off northward. For the ice-transportation I expected to rely, mainly, upon the dog of the Esquimaux."

Dr. Hayes had a strong belief in the existence of an open Polar Sea, but it may here be mentioned that subsequent exploration proved that his views were not correct. On the other hand, the view of the old geographers that for a long distance around the Pole the sea was covered with immovable ice has also been disproved. Throughout the whole year the ice is found to be more or less in motion, except where it is in contact with the land.

Dr. Hayes expected to be able to start with two vessels,—one a small steamer, to be taken out under sails, and the steam-power only to be used when actually among the ice; the other a sailing vessel, to be employed as a tender or store-ship. He found, however, that the fund which he had raised with great difficulty would only enable him to fit out and man one small sailing vessel.

A fore-and-aft schooner of 133 tons register, named *Spring Hill*, was purchased, and after some necessary alterations, was rechristened *United States*.

August Sonntag, the astronomer of Kane's expedition,

early volunteered to accompany Hayes. On his return to the United States he was appointed to the Dudley Observatory, Albany, and to accompany Dr. Hayes he sacrificed the fine position of Associate Director of that institution.

Including Dr. Hayes, the party numbered fifteen persons. They left Boston on 7th July 1860, and after a rough passage crossed the Arctic Circle on 30th July. The first iceberg was met on the previous day. Some rough weather was experienced in Davis' Strait, and is thus described by Hayes :—

"We were running before the wind and fighting a wretched cross-sea under reefed fore and mainsail and jib, when the fore fife-rail was carried away;—down came everything to the deck, and there was left not a stitch of canvas on the schooner but the lumbering mainsail. It was a miracle that we did not broach to and go to the bottom. Nothing saved us but a steady hand at the helm.

"Notwithstanding all this knocking about, everybody seemed to take it for granted that this sort of thing is very natural and proper, and a part of the engagement for the cruise. It is at least gratifying to see that they take kindly to discomfort, and receive every freak of fortune with manly good-nature. I really believe that were affairs otherwise ordered they would be sadly disappointed. They are 'the small band of brave and spirited men' they read about in the newspapers, and they mean to show it. The sailors are sometimes literally drowned out of the forecastle. The cabin is flooded at least a dozen times a day. The skylight has been knocked to pieces by the head of a sea, and the table, standing directly under it, has been more than once cleared of crockery and eatables without the aid of the steward. My own cabin gets washed out at irregular intervals, and my books are half of them spoiled by tumbling from their

shelves in spite of all I can do to the contrary. Once I caught the whole library tacking about the deck after an unusually ambitious dive of the schooner, and the advent of a more than ordinarily heavy rush of water through the 'companion-way.'"

Land was first sighted on the 31st July, and proved to be the southern extremity of Disco Island. Owing to a calm, Proven was not reached till 6th August. The entry into the harbour is thus described by Dr. Hayes:—

"We were escorted into the harbour of Proven by the strangest fleet of boats and the strangest-looking boatmen that ever convoyed a ship. They were the far-famed Kayakers of Greenland, and they deserve a passing notice.

"The Kayak of the Greenlander is the frailest specimen of marine architecture that ever carried human freight. It is 18 feet long and as many inches wide at its middle, and tapers, with an upward curving line, to a point at either end. The skeleton of the boat is made of light wood; the covering is of tanned seal-skin, sewed together by the native women with sinew thread, and with a strength and dexterity quite astonishing. Not a drop of water finds its way through their seams, and the skin itself is perfectly waterproof. The boat is about 9 inches deep, and the top is covered like the bottom. There is no opening into it except a round hole in the centre, which admits the hunter as far as his hips. This hole is surrounded with a wooden rim, over which the Kayaker laces the lower edge of his water-tight jacket, and thus fastens himself in and keeps the water out. He propels himself with a single oar about 6 feet long, which terminates in a blade or paddle at either end. This instrument of locomotion is grasped in the centre, and is dipped in the water alternately to right and left. The boat is graceful as a duck and light as a feather. It has no ballast and no keel, and it rides almost on the surface

of the water. It is therefore necessarily top-heavy. Long practice is required to manage it, and no tight-rope dancer ever needed more steady nerve and skill of balance than this same savage Kayaker. Yet, in this frail craft, he does not hesitate to ride seas which would swamp an ordinary boat, or to break through surf which may sweep completely over him. But he is used to hard battles, and, in spite of every fortune, he keeps himself upright."

Hayes expected to obtain a supply of dogs at Proven, but he found that a disease which had prevailed among the teams during the previous year had diminished the stock to less than half of what was required by the people themselves, and he had to be satisfied with a few dogs of inferior quality. The Danish officials, however, rendered Hayes all the assistance in their power, and gave him hope of being more successful at Upernavik, for which settlement he left on 12th August.

During the night, before reaching Upernavik, the carpenter of the expedition, Gibson Caruthers, died suddenly. Besides Mr. Sonntag and Dr. Hayes, he was the only member of the party who had been in the Arctic seas, having served in the First Grinnell Expedition in search of Franklin. He was buried at Upernavik.

Having obtained about two dozen dogs, and a supply of reindeer, seal, and dog skins, Upernavik was left after four days' delay. Three Esquimaux, an interpreter, and two Danish sailors were engaged at Upernavik. At Tessuissak, a place about 60 miles from Upernavik, a team of dogs, the property of the interpreter, was obtained.

When Melville Bay was reached, Hayes was delighted to find open water with only an iceberg here and there. This was crossed in the short space of fifty-five hours. Near the northern part of the bay a loose pack about 15 miles wide was encountered, but under a full pressure of canvas, little difficulty was experienced in "boring" it.

Standing close in under Cape York, Hayes kept a careful look-out for natives. He wished if possible to ascertain whether Hans of the Kane expedition was there. In this he was successful. Hayes writes:—

"Six years' experience among the wild men of this barren coast had brought him to their level of filthy ugliness. His companions were his wife, who carried her first-born in a hood upon her back; her brother, a bright-eyed boy of twelve years, and 'an ancient dame with voluble and flippant tongue,' her mother. They were all dressed in skins, and, being the first Esquimaux we had seen whose habits remained wholly uninfluenced by contact with civilisation, they were, naturally, objects of much interest to us all.

"Hans led us up the hillside, over rough rocks and through deep snow-drifts, to his tent. It was pitched about 200 feet above the level of the sea, in a most inconvenient position for a hunter; but it was his 'look-out.' Wearily he had watched, year after year, for the hoped-for vessel; but summer after summer passed and the vessel came not, and he still sighed for his southern home and the friends of his youth.

"His tent was a sorry habitation. It was made after the Esquimaux fashion, of seal-skins, and was barely large enough to hold the little family who were grouped about us.

"I asked Hans if he would go with us.

"'Yes!'

"Would he take his wife and baby?

"'Yes!'

"Would he go without them?

"'Yes!'

"Having no leisure to examine critically into the state of his mind, and having an impression that the permanent separation of husband and wife is regarded as a painful

event, I gave the Esquimaux mother the benefit of this conventional suspicion, and brought them both aboard, with their baby and their tent and all their household goods. The old woman and bright-eyed boy cried to be taken along; but I had no further room, and we had to leave them to the care of the remainder of the tribe, who, about twenty in number, had discovered the vessel, and came shouting gleefully over the hill. After distributing to them some useful presents, we pushed off for the schooner.

"Hans was the only unconcerned person in the party. I subsequently thought that he would have been quite as well pleased had I left his wife and child to the protection of their savage kin; and had I known him as well then as, with good reason, I knew him afterwards, I would not have gone out of my way to disturb his barbarous existence."

Cape Alexander, at the entrance to Smith Sound, was reached without any special difficulty. Standing over towards Cape Isabella on the opposite side of the sound, there seemed a good prospect of being able to reach it, but soon a heavy pack was met with, and a furious gale coming on compelled Hayes to run back to the coast for shelter. On the 31st August, during this gale, the schooner dragged its anchors. What followed is thus described by Hayes: "McCormick managed to save the bower, but the kedge was lost. It caught a rock at a critical moment, and, the hawser parting, we were driven upon the bergs, which, as before stated, had grounded astern of us. The collision was a perfect crash. The stern boat flew into splinters, the bulwarks over the starboard-quarter were stove in, and, the schooner's head swinging round with great violence, the jib-boom was carried away, and the bowsprit and foretopmast were both sprung. In this crippled condition we at length

escaped most miraculously, and under bare poles scudded before the wind. A vast number of icebergs and the 'pack' coming in view, we were forced to make sail. The mainsail went to pieces as soon as it was set, and we were once more in great jeopardy; but fortunately the storm abated, and we have since been threshing to windward, and are once more within Smith Sound."

Hayes again attempted to reach Cape Isabella, but the pack was again met. He then attempted to pass up the Greenland coast so as to try to cross farther north. However, another gale set in, and he was forced to take shelter behind Cape Alexander. When the gale subsided he again entered the sound, but was soon beset in the ice, and the schooner was seriously damaged. Even after this, another attempt was made to pass up the coast, but it ended in failure, and Hayes was forced to put into Hartstene Bay for the winter. The harbour was named Port Foulke, in honour of William Parker Foulke, of Philadelphia, who was one of the earliest, and continued to be throughout one of the most constant advocates of the expedition. Port Foulke is situated about 8 nautical miles in a north-easterly direction from Cape Alexander. An abundance of game was found in the neighbourhood, and consisted of deer, hares, foxes, and birds.

During October, Hayes made a journey inland, ascending a glacier, named by Kane after his brother John, with five men, and taking with him a sledge loaded with eight days' provisions, a small canvas tent, two buffalo-skins for bedding, and a cooking-lamp. The party reached a point 70 miles from the coast, at an elevation of 5000 feet. Hayes describes it as a vast frozen Sahara, immeasurable to the human eye. He goes on to compare the river systems of the Temperate and Equatorial Zones with the glacier systems of the Arctic and Antarctic, and draws a

delightful picture of the great law of Circulation and Change:—

"The dewdrop, distilled upon the tropic palm-leaf, falling to the earth, has reappeared in the gurgling spring of the primeval forest, has flown with the rivulet to the river, and with the river to the ocean; has then vanished into the air, and, wafted northward by the unseen wind, has fallen as a downy snowflake upon the lofty mountain, where, penetrated by a solar ray, it has become again a little globule of water, and the chilly wind, following the sun, has converted this globule into a crystal; and the crystal takes up its wandering course again, seeking the ocean.

"But where its movement was once rapid, it is now slow; where it then flowed with the river miles in an hour, it will now flow with the glacier not more in centuries; and where it once entered calmly into the sea, it will now join the world of waters in the midst of a violent convulsion.

"We have thus seen that the iceberg is the discharge of the Arctic river, that the Arctic river is the glacier, and that the glacier is the accumulation of the frozen vapours of the air. We have watched this river, moving on its slow and steady course from the distant hills, until at length it has reached the sea; and we have seen the sea tear from the slothful stream a monstrous fragment, and take back to itself its own again. Freed from the shackles which it has borne in silence through unnumbered centuries, this new-born child of the ocean rushes with a wild bound into the arms of the parent water, where it is caressed by the surf and nursed into life again; and the crystal drops receive their long-lost freedom, and fly away on the laughing waves to catch once more the sunbeam, and to run again their course through the long cycle of the ages.

"And this iceberg has more significance than the great flood which the glacier's southern sister, the broad Amazon, pours into the ocean from the slopes of the Andes and the mountains of Brazil. Solemn, stately, and erect, in tempest and in calm, it rides the deep. The restless waves resound through its broken archways and thunder against its adamantean walls. Clouds, impenetrable as those which shielded the graceful form of Arethusa, clothe it in the morning; under the bright blaze of the noonday sun it is armoured in glittering silver; it robes itself in the gorgeous colours of evening; and in the silent night the heavenly orbs are mirrored in its glassy surface. Drifting snows whirl over it in the winter, and the sea-gulls swarm round it in the summer. The last rays of departing day linger upon its lofty spires; and when the long darkness is past it catches the first gleam of the returning light, and its gilded dome heralds the coming morn. The elements combine to render tribute to its matchless beauty. Its loud voice is wafted to the shore, and the earth rolls it from crag to crag among the echoing hills. The sun steals through the veil of radiant fountains which flutter over it in the summer winds, and the rainbow on its pallid cheek betrays the warm kiss. The air crowns it with wreaths of soft vapour, and the waters around it take the hues of the emerald and the sapphire. In fulfilment of its destiny it moves steadily onward in its blue pathway through the varying seasons and under the changeful skies. Slowly, as in ages long gone by it arose from the broad waters, so does it sink back into them. It is indeed a noble symbol of the Law, —a monument of Time's slow changes, more ancient than the Egyptian Pyramids or the obelisk of Heliopolis. Its crystals were dewdrops and snowflakes long before the human race was born in Eden."

By the 28th October, 74 reindeer, 21 foxes, 12 hares,

1 seal, 14 eider ducks, 8 dovekies, 6 auks, and 1 ptarmigan had been shot and brought on board. In addition to these, some 20 to 30 reindeer had been cached in various places. Hayes naturally came to the conclusion that men might live indefinitely at Port Foulke without being troubled with scurvy.

On the 19th November, one of the Esquimaux, Peter, disappeared. For some time Hayes had observed a rivalry between Hans and Peter, and he took the side of the latter. Hans was jealous of every act of favour towards Peter, and Hayes was inclined to believe that Hans had been the means of frightening Peter and of making him run off. No news was received as to his whereabouts until months afterwards, when some Esquimaux found his dead body in a hut a long distance from the ship.

Early in December a serious disease attacked the dogs, similar to what Kane had to deal with. Hayes had at this time thirty-six, and the first attacked by the disease was shot. However, seven died within four days, and during the first two weeks of December eighteen died. At the end of the following week only nine dogs were left. This was a serious blow to Hayes, as he relied chiefly on the dogs for transport across the ice. It was now necessary to devise means for remedying the loss, or to arrange new plans in conformity with the changed circumstances. The first expedient which suggested itself was to open communication with the Esquimaux of Whale Sound, from whom some animals might be obtained. From Hans it was learned that there was a family living on Northumberland Island, several families on the south side of Whale Sound, and possibly one or more on the north side. Northumberland Island was about 100 miles distant, and the south side of the Sound about 150. It was decided that if a sufficient number of dogs remained alive when the moon came in December, Sonntag

should make the journey at that period, taking a single sledge, and Hans for a driver. They set out on the 21st December, and nothing was heard of them until the 29th January, when two Esquimaux arrived with the news that Sonntag had died. Hans appeared two days afterwards, and told his story :—

"The travellers rounded Cape Alexander without difficulty, finding the ice solid; and they did not halt until they had reached Sutherland Island, where they built a snow-hut and rested for a few hours. Continuing thence down the coast, they sought the Esquimaux at Sorfalik without success. The native hut at that place being in ruins, they made for their shelter another house of snow; and after being well rested, they set out directly for Northumberland Island, having concluded that it was useless to seek longer for natives on the north side of the sound. They had proceeded on their course about 4 or 5 miles, as nearly as I can judge from Hans's description, when Sonntag, growing a little chilled, sprang off the sledge and ran ahead of the dogs to warm himself with the exercise. The tangling of a trace obliging Hans to halt the team for a few minutes, he fell some distance behind, and was hurrying on to catch up, when he suddenly observed Sonntag sinking. He had come upon the thin ice, covering a recently open tide-crack, and, probably not observing his footing, he slipped upon it unawares. Hans hastened to his rescue, aided him out of the water, and then turned back for the shelter which they had recently abandoned. A light wind was blowing at the time from the north-east, and this, according to Hans, caused Sonntag to seek the hut without stopping to change his wet clothing. At first he ran beside the sledge, and thus guarded against danger; but after a while he rode, and when they halted at Sorfalik, Hans discovered that his companion was stiff

and speechless. Assisting him into the hut with all possible dispatch, Hans states that he removed the wet and frozen clothing, and placed Sonntag in the sleeping-bag. He next gave him some brandy which he found in a flask on the sledge; and, having tightly closed the hut, he lighted the alcohol lamp, for the double purpose of elevating the temperature and making some coffee; but all his efforts were unavailing, and, after remaining for nearly a day unconscious, Sonntag died. He did not speak after reaching the hut, and left no message of any kind."

Hayes was not altogether satisfied with the explanation given by Hans. He wrote: "Although I have no good reason for doubting the truth of his narrative, yet I cannot quite reconcile my mind to the fact that Sonntag, with so much experience to govern him, should have undertaken to travel 5 miles in wet clothing, especially as he was accompanied by a native hunter who was familiar with all of the expedients for safety upon the ice-fields, and to whom falling in the water is no unusual circumstance. The sledge and the canvas apron which enclosed the cargo furnished the means for constructing a temporary shelter from the wind, and the sleeping-bag would have insured against freezing while Hans got ready the dry clothing, of which Sonntag carried a complete change. Nor can I understand how he should have lived so long and have given Hans no message for me, nor have spoken a word after coming out of the water, further than to have ordered his driver to hasten back to the snow-hut. However, it is idle to speculate about the matter; and since Hans's interests were concerned in proving faithful to the officer who, of all those in the ship, cared most for him, it would be unreasonable as well as unjust to suspect him of desertion."

Towards spring, Hayes had the body of Sonntag

brought to Port Foulke and buried. "And here," writes Hayes, "in the drear solitude of the Arctic desert, our comrade sleeps the sleep that knows no waking in this troubled world,—where no loving hands can ever come to strew his grave with flowers, nor eyes grow dim with sorrowing; but the gentle stars, which in life he loved so well, will keep over him eternal vigil, and the winds will wail over him, and Nature, his mistress, will drop upon his tomb her frozen tears for evermore."

When Hans returned from his visit to the Esquimaux, he brought with him his wife's father and mother. Hayes gives the following description of them:—

"The personal appearance of this interesting couple was not peculiarly attractive. Their faces were broad, jaws heavy, cheek-bones projecting like other carnivorous animals, foreheads narrow, eyes small and very black, noses flat, lips long and thin, and when opened, there were disclosed two narrow, white, well-preserved rows of polished ivory,—well worn, however, with long use and hard service, for the teeth of the Esquimaux serve a great variety of purposes, such as softening skins, pulling and tightening cords, besides masticating food, which I may here mention is wholly animal. Their hair was jet black, though not abundant, and the man had the largest growth of beard which I have seen upon an Esquimaux face, but it was confined to the upper lip and the tip of the chin. The face of the Esquimaux is indeed quite Mongolian in its type, and is usually beardless. In stature they are short, though well built, and bear, in every movement, evidence of strength and endurance.

"The dress of the male and female differed but little one from the other. It consisted of nine pieces—a pair of boots, stockings, mittens, pantaloons, an under-dress, and a coat. The man wore boots of bear-skin, reaching to the top of the calf, where they met the pantaloons,

which were composed of the same materials. The boots of the woman reached nearly to the middle of the thigh, and were made of tanned seal-skins. Her pantaloons, like her husband's, were of bear-skin. The stockings were of dog-skin, and the mittens of seal-skin. The under-dress was made of bird-skins, feathers turned inwards; and the coat, which did not open in front, but was drawn on over the head like a shirt, was of blue fox-skins. This coat terminates in a hood which envelops the head as completely as an Albanian capote or a monk's cowl. This hood gives the chief distinction to the dresses of the sexes. In the costume of the man it is round, closely fitting the scalp, while in the woman it is pointed at the top to receive the hair which is gathered up on the crown of the head, and tied into a hard, horn-like tuft with a piece of raw seal-hide,—a style of coiffure which, whatever may be its other advantages, cannot be regarded as peculiarly picturesque.

"Their ages could not be determined; for, since the Esquimaux cannot enumerate beyond their ten fingers, it is quite impossible for them to refer to a past event by any process of notation. Having no written language whatever, not even the picture-writing and hieroglyphics of the rudest Indian tribes of North America, the race possesses no records, and such traditions as may come down from generation to generation are not fixed by any means which will furnish even an approximate estimate of their periods of growth, prosperity, and decay, or even of their own ages."

Towards the end of February other three Esquimaux appeared from the south, and from them Hayes obtained some dogs.

About the middle of March, Hayes made a preliminary journey in order to explore the track for his extended journey to the north, and cached some pro-

visions at Cairn Point. He visited Rensselaer Harbour, where the *Advance* had been left, but no vestige of the ship remained, except a small bit of a deck-plank which Hayes picked up near the site of the old observatory.

The long sledge-journey began on the 3rd of April 1861. A quantity of provisions had previously been taken to Cairn Point, which Hayes had decided to make the starting-place for crossing the Sound. On one sledge was mounted a 20-foot metallic lifeboat with which Hayes hoped to navigate the Polar Sea. When Cairn Point was reached, Hayes decided to leave the boat there, as he saw that it was impossible to take the boat and cargo across the Sound in one journey. A storm delayed the party several days at Cairn Point, and soon after encountering the ice-hummocks, Hayes wrote:—

"I need hardly say that I soon gave up all thought of trying to get the boat across the Sound. A hundred men could not have accomplished the task. My only purpose now was to get to the coast of Grinnell Land with as large a stock of provisions as possible, and to retain the men as long as they could be of use; but it soon became a question whether the men themselves could carry over their own provisions independent of the surplus which I should require in order that the severe labour should result to advantage. In spite, however, of everything, the men kept steadfastly to their duty, through sunshine and through storm, through cold, and danger, and fatigue."

Hayes tried to make for Cape Sabine, but found the hummocks quite impassable, and he had to bear more to the northward. On the 25th of April he reported: "My party are in a very sorry condition. One of the men has sprained his back from lifting; another has a sprained ankle; another has gastritis; another a frosted toe; and all are thoroughly overwhelmed with fatigue."

On the 27th April he determined to send back the men, with the exception of Knorr, Jensen, and McDonald. Only about half of the Sound had been crossed, but Hayes decided to struggle on. Jensen became partially snow-blind, and on the 3rd of May, when stumbling along, his leg received a severe wrench in a crack in the ice. The land, at Cape Hawks, was not reached until the 11th of May. Thirty-one days had been occupied in crossing the Sound. Hayes writes:—

"The journey across the Sound from Cairn Point was unexampled in Arctic travelling. The distance from land to land, as the crow flies, did not exceed 80 miles; and yet, as hitherto observed, the journey consumed thirty-one days—but little more than 2 miles daily. The track, however, which we were forced to choose, was often at least three times that of a straight line; and since almost every mile of that tortuous route was travelled over three and five times, in bringing up the separate portions of our cargo, our actual distance did not probably average less than 16 miles daily, or about 500 miles in all, between Cairn Point and Cape Hawks. The last 40 miles, made with dog-sledges alone, occupied fourteen days—a circumstance which will of itself exhibit the difficult nature of the undertaking, especially when it is borne in mind that 40 miles to an ordinary team of dogs, over usually fair ice, is a trifling matter for five hours, and would not fatigue the team half so much as a single hour's pulling of the same load over such hummocks as confronted us throughout this entire journey.

"In order to obtain the best results which the Esquimaux dog is capable of yielding, it is essential that he shall be able to trot away with his load. To walk at a dead drag is as distressing to his spirits and energies as the hauling of a dray would be to a blooded horse; and he will much more readily run away with a

100 pounds over good ice than to pull one-fourth of that weight over a track which admits only of a slow pace."

The failure to get the boat, or even a foot-party, over the Sound disarranged Hayes' original plans. Of the 800 lb. of dog-food which he had when he sent back the men, only about 300 lb. remained. Small dépôts had, however, been made for the return journey. The most that Hayes now hoped to do was to explore the route to the shores of the Polar Sea, as a basis for further exploration to follow the event of his reaching the west side of Smith Sound with his vessel late in the summer.

The first day's march from Cape Hawks carried the party across the wide bay to Cape Napoleon, and they were pleased to find that the whole load could be carried at one time, although the travelling was far from good. Deep snow was met, and in wading through it Jensen's leg gave way, and he had to be carried on the sledge. From Cape Napoleon to Cape Frazer the travelling was good, and camp was made near the farthest point reached by Hayes in 1854. The little flag-staff, which Hayes had planted, was discovered, still standing erect among the rocks; but not a vestige of the flag remained. The winds had whipped it entirely away.

On the 16th of May, Jensen's injured leg was so painful that Hayes decided to leave him behind in charge of McDonald.

From Cape Frazer northward the description given by Hayes of his route is extremely meagre and vague. He states that when Jensen was left behind he was about 60 miles to the northward and westward of Cape Constitution, reached by Morton. About two days after leaving Jensen, Hayes reached the southern cape of a bay which was so deep that, as in other cases of like obstruction, he determined to cross over it rather than to follow the shore-line. He writes: "We had gone only a few miles when we found our progress suddenly

arrested. Our course was made directly for a conspicuous headland bounding the bay to the northward, over a strip of old ice lining the shore. This headland seemed to be about 20 miles from us, or near latitude 82°, and I was very desirous of reaching it; but, unhappily, the old ice came suddenly to an end, and after scrambling over the fringe of hummocks which margined it, we found ourselves upon ice of the late winter. The unerring instinct of the dogs warned us of approaching danger. They were observed for some time to be moving with unusual caution, and finally they scattered to right and left, and refused to proceed farther. This behaviour of the dogs was too familiar to me to leave any doubt as to its meaning; and moving forward in advance, I quickly perceived that the ice was rotten and unsafe. Thinking that this might be merely a local circumstance, resulting from some peculiarity of the current, we doubled back upon the old floe and made another trial farther to the eastward. Walking now in advance of the dogs, they were inspired with greater courage. I had not proceeded far when I found the ice again giving way under the staff with which I sounded its strength, and again we turned back and sought a more eastern passage.

"Two hours consumed in efforts of this kind, during which we had worked about 4 miles out to sea, convinced me that the ice outside the bay was wholly impassable."

An attempt to cross farther up the bay also proved a failure, and by walking a few miles along the shore Hayes believed he saw the head of the bay about 20 miles distant. Next day he climbed to the top of a cliff supposed to be about 800 feet above the level of the sea.

"The view which I had from this elevation furnished a solution of the cause of my progress being arrested on the previous day.

"The ice was everywhere in the same condition as in the mouth of the bay, across which I had endeavoured to pass. A broad crack, starting from the middle of the bay, stretched over the sea, and uniting with other cracks as it meandered to the eastward, it expanded as the delta of some mighty river discharging into the ocean, and under a water-sky, which hung upon the northern and eastern horizon, it was lost in the open sea.

"Standing against the dark sky at the north, there was seen in dim outline the white sloping summit of a noble headland—the most northern known land upon the globe. I judged it to be in latitude 82° 30′, or 450 miles from the North Pole. Nearer, another bold cape stood forth; and nearer still the headland, for which I had been steering my course the day before, rose majestically from the sea, as if pushing up into the very skies a lofty mountain peak, upon which the winter had dropped its diadem of snows. There was no land visible except the coast upon which I stood."

The large bay which Hayes here refers to was named Lady Franklin Bay. The place from which his observations were made, Hayes gives as in latitude 81° 35′, longitude 70° 30′ W. Finding his way to the north impassable, he decided to return. Hayes at this point came to the conclusion that he was near the shores of the Polar Basin, and that Kennedy Channel expanded into it. After building a cairn and leaving a record in a small glass vial, he started on his return journey.

A storm came on soon after Hayes and his companion set out. They at first tried to shelter in the lee of a huge ice-cliff, but as they had now given the dogs the last of their food, they decided to face the snowstorm and make for the camp where Jensen had been left. This was reached in twenty-two hours under great difficulties. Hayes and Knorr had fasted thirty-four hours, and were

completely exhausted. On the return journey to the ship they had to depend entirely on the small caches which had been left on the outward journey. Fortunately, all of these, with one exception, were undisturbed. By the time they reached Cape Hawks and were about to cross the Sound, Jensen's leg had so far improved that he was able to walk. Near the Greenland coast the ice was beginning to give way, and it was with difficulty that they reached land. Part of the journey to the ship had then to be made on foot across the mountains.

During the absence of Hayes, McCormick the sailing-master had examined the ship, and found that the damage sustained in the ice was serious. He repaired it as well as he could, but it was not now in a condition to stand any further collision with the ice. This was a great disappointment to Hayes, as he intended, as soon as the ice broke up, to make another attempt with the ship to cross the Sound, and pass up the west coast.

On the 3rd of July, Hayes describes a walrus-hunt:—

"I have had a walrus-hunt and a most exciting day's sport. Much ice has broken adrift and come down the Sound during the past few days; and, when the sun is out bright and hot, the walrus come up out of the water to sleep and bask in the warmth on the pack. Being upon the hilltop this morning to select a place for building a cairn, my ear caught the hoarse bellowing of numerous walrus; and, upon looking over the sea, I observed that the tide was carrying the pack across the outer limit of the bay, and that it was alive with the beasts, which were filling the air with such uncouth noises. Their number appeared to be even beyond conjecture, for they extended as far as the eye could reach, almost every piece of ice being covered. There must have been, indeed, many hundreds, or even thousands.

"Hurrying from the hill, I called for volunteers, and quickly had a boat's crew ready for some sport. Putting three rifles, a harpoon, and a line into one of the whale-boats, we dragged it over the ice to the open water, into which it was speedily launched.

"We had about 2 miles to pull before the margin of the pack was reached. On the cake of ice to which we first came, there were perched about two dozen animals; and these we selected for the attack. They covered the raft almost completely, lying huddled together, lounging in the sun or lazily rolling and twisting themselves about, as if to expose some fresh part of their unwieldy bodies to the warmth,—great, ugly, wallowing sea-hogs, they were evidently enjoying themselves, and were without apprehension of approaching danger. We neared them slowly, with muffled oars.

"As the distance between us and the game steadily narrowed, we began to realise that we were likely to meet with rather formidable antagonists. Their aspect was forbidding in the extreme, and our sensations were perhaps not unlike those which the young soldier experiences who hears for the first time the order to charge the enemy. We should all, very possibly, have been quite willing to retreat had we dared own it. Their tough, nearly hairless hides, which are about an inch thick, had a singularly iron-plated look about them, peculiarly suggestive of defence; while their huge tusks, which they brandished with an appearance of strength that their awkwardness did not diminish, looked like very formidable weapons of offence if applied to a boat's planking or to the human ribs, if one should happen to find himself floundering in the sea among the thick-skinned brutes. To complete the hideousness of a facial expression which the tusks rendered formidable enough in appearance, Nature had endowed them with broad flat noses, which

were covered all over with stiff whiskers, looking much like porcupine quills, and extending up to the edge of a pair of gaping nostrils. The use of these whiskers is as obscure as that of the tusks; though it is probable that the latter may be as well weapons of offence and defence as for the more useful purpose of grubbing up from the bottom of the sea the mollusks which constitute their principal food. There were two old bulls in the herd who appeared to be dividing their time between sleeping and jamming their tusks into each other's faces, although they appeared to treat the matter with perfect indifference, as they did not seem to make any impression on each other's thick hides. As we approached, these old fellows —neither of which could have been less than 16 feet long, nor smaller in girth than a hogshead—raised up their heads, and, after taking a leisurely survey of us, seemed to think us unworthy of further notice; and then, punching each other again in the face, fell once more asleep. This was exhibiting a degree of coolness rather alarming. If they had showed the least timidity we should have found some excitement in extra caution; but they seemed to make so light of our approach that it was not easy to keep up the bold front with which we had commenced the adventure. But we had come quite too far to think of backing out; so we pulled in and made ready for the fray.

"Beside the old bulls, the group contained several cows and a few calves of various sizes,—some evidently yearlings, others but recently born, and others half or three-quarters grown. Some were without tusks, while on others they were just sprouting; and above this they were of all sizes up to those of the big bulls, which had great curved cones of ivory, nearly 3 feet long. At length we were within a few boats' lengths of the ice-raft, and the game had not taken alarm. They had probably

never seen a boat before. Our preparations were made as we approached. The walrus will always sink when dead, unless held up by a harpoon-line; and there was therefore but two chances for us to secure our game—either to shoot the beast dead on the raft, or to get a harpoon well into him after he was wounded, and hold on to him until he was killed. As to killing the animal where he lay, that was not likely to happen, for the thick skin destroys the force of the ball before it can reach any vital part, and indeed, at a distance, actually flattens it; and the skull is so heavy that it is hard to penetrate with an ordinary bullet, unless the ball happens to strike through the eye.

"To Miller, a cool and spirited fellow, who had been after whales on the 'nor'-west coast,' was given the harpoon, and he took his station in the bows; while Knorr, Jensen, and myself kept our places in the stern-sheets, and held our rifles in readiness. Each selected his animal, and we fired in concert over the heads of the oarsmen. As soon as the rifles were discharged, I ordered the men to 'give way,' and the boat shot right among the startled animals as they rolled off pell-mell into the sea. Jensen had fired at the head of one of the bulls, and hit him in the neck; Knorr killed a young one, which was pushed off in the hasty scramble and sank; while I planted a minie-bullet somewhere in the head of the other bull and drew from him a most frightful bellow—louder, I venture to say, than ever came from wild bull of Bashan. When he rolled over into the water, which he did with a splash that sent the spray flying all over us, he almost touched the bows of the boat, and gave Miller a good opportunity to get in his harpoon, which he did in capital style.

"The alarmed herd seemed to make straight for the bottom, and the line spun out over the gunwale at a

fearful pace; but having several coils in the boat, the end was not reached before the animals began to rise, and we took in the slack and got ready for what was to follow. The strain of the line whipped the boat around among some loose fragments of ice, and the line having fouled among it, we should have been in great jeopardy had not one of the sailors promptly sprung out, cleared the line, and defended the boat.

"In a few minutes the whole herd appeared at the surface, about 50 yards away from us, the harpooned animal being among them. Miller held fast to his line, and the boat was started with a rush. The coming up of the herd was the signal for a scene which baffles description. They uttered one wild concerted shriek, as if an agonised call for help; and then the air was filled with answering shrieks. The 'huk! huk! huk' of the wounded bulls seemed to find an echo everywhere, as the cry was taken up and passed along from floe to floe, like the bugle-blast passed from squadron to squadron along a line of battle; and down from every piece of ice plunged the startled beasts, as quickly as the sailor drops from his hammock when the long-roll beats to quarters. With their ugly heads just above the water, and with mouths wide open, belching forth the dismal 'huk! huk! huk!' they came tearing toward the boat.

"In a few moments we were completely surrounded, and the numbers kept multiplying with astonishing rapidity. The water soon became alive and black with them.

"They seemed at first to be frightened and irresolute, and for a time it did not seem that they meditated mischief; but this pleasing prospect was soon dissipated, and we were forced to look well to our safety.

"That they meditated an attack there could no longer be a doubt. To escape the onslaught was impossible.

We had raised a hornet's nest about our ears in a most astonishingly short space of time, and we must do the best we could. Even the wounded animal to which we were fast turned upon us, and we became the focus of at least a thousand gaping, bellowing mouths.

"It seemed to be the purpose of the walrus to get their tusks over the gunwale of the boat, and it was evident that, in the event of one such monster hooking on to us, the boat would be torn in pieces, and we would be left floating in the sea helpless. We had good motive, therefore, to be active. Miller plied his lance from the bows, and gave many a serious wound. The men pushed back the onset with their oars, while Knorr, Jensen, and myself loaded and fired our rifles as rapidly as we could. Several times we were in great jeopardy, but the timely thrust of an oar, or the lance, or a bullet saved us. Once I thought we were surely gone. I had fired, and was hastening to load; a wicked-looking brute was making at us, and it seemed probable that he would be upon us. I stopped loading, and was preparing to cram my rifle down his throat, when Knorr, who had got ready his weapon, sent a fatal shot into his head. Again, an immense animal, the largest that I had ever seen, and with tusks apparently 3 feet long, was observed to be making his way through the herd with mouth wide open, bellowing dreadfully. I was now as before busy loading; Knorr and Jensen had just discharged their pieces, and the men were well engaged with their oars. It was a critical moment, but happily I was in time. The monster, his head high above the boat, was within 2 feet of the gunwale, when I raised my piece and fired into his mouth. The discharge killed him instantly, and he went down like a stone.

"This ended the fray. I know not why, but the whole herd seemed suddenly to take alarm, and all dove

down with a tremendous splash almost at the same instant. When they came up again, still shrieking as before, they were some distance from us, their heads all now pointed seaward, making from us as fast as they could go, their cries growing more and more faint as they retreated in the distance. We must have killed at least a dozen, and mortally wounded as many more. The water was in places red with blood, and several half-dead and dying animals lay floating about us. The bull to which we were made fast pulled away with all his might after the retreating herd, but his strength soon became exhausted; and, as his speed slackened, we managed to haul in the line, and finally approached him so nearly that our rifle-balls took effect, and Miller at length gave him the *coup de grâce* with his lance. We then drew him to the nearest piece of ice, and I had soon a fine specimen to add to my Natural History collections. Of the others we secured only one; the rest had died and sunk before we reached them.

"I have never before regarded the walrus as a really formidable animal; but this contest convinces me that I have done their courage great injustice. They are full of fight; and had we not been very active and self-possessed, our boat would have been torn to pieces, and we either drowned or killed. A more fierce attack than that which they made upon us could hardly be imagined, and a more formidable-looking enemy than one of these huge monsters, with his immense tusks and bellowing throat, would be difficult to find. Next time I try them I will arm my boat's crew with lances. The rifle is a poor reliance, and but for the oars, the herd would have been on top of us at any time."

Upon the top of the hill on the north side of the harbour a cairn was constructed, and under it Hayes deposited a brief record of the voyage. On the 11th July

1861, the ice broke up in the harbour, and the schooner was once more afloat, after ten months' imprisonment.

On the 13th July, Hayes took leave of the Esquimaux, who were sorry to see him depart.

Hayes, although doubtful as to the prospect ahead, was determined not to quit the field without making another attempt to reach the west coast and endeavour to obtain some further information that might be of service in the future. He still had a vague hope that, even with his crippled vessel, some such good prospect might open before him as would justify him in remaining. He therefore held once more for Cape Isabella, but met the pack about 10 miles from the Greenland shore. He turned back and anchored between Littleton and McGary Islands. After a few days' delay, another attempt was made, and in two days the west coast was reached near Gale Point, about 10 miles below Cape Isabella. Hayes then took a whale-boat to the cape, but found it impassable.

His opinion of the situation was thus recorded at the time:—

"I am fully persuaded, if there still remained a lingering doubt, of the correctness of my decision to return home, and come out next year strengthened and refitted with steam. If my impulses lead me to try conclusions once more with the ice, my judgment convinces me that it would be at the risk of everything. As well use a Hudson River steamboat for a battering-ram as this schooner, with her weakened bows, to encounter the Smith Sound ice.

"I have secured the following important advantages for the future, and with these I must, perforce, rest satisfied, for the present:—

"(1) I have brought my party through without sickness, and have thus shown that the Arctic winter of itself breeds neither scurvy nor discontent.

"(2) I have shown that men may subsist themselves in Smith Sound independent of support from home.

"(3) That a self-sustaining colony may be established at Port Foulke, and be made the basis of an extended exploration.

"(4) That the exploration of this entire region is practicable from Port Foulke—having from that starting-point pushed my discoveries much beyond those of my predecessors, without any second party in the field to co-operate with me, and under the most adverse circumstances.

"(5) That, with a reasonable degree of certainty, it is shown that, with a strong vessel, Smith Sound may be navigated and the open sea reached beyond it.

"(6) I have shown that the open sea exists."

In returning home, Hayes visited Whale Sound and explored it as far as he could, and named Inglefield Gulf.

At Upernavik news was received of trouble in the United States, but it was not till they put in to Halifax, Nova Scotia, that they learnt that civil war had broken out. This was terrible news to Hayes. He had intended to return to the Arctic regions with a ship fitted with steam-power, and to continue his explorations. The war altered everything. As soon as he reached Boston he wrote to the President, asking for immediate employment in the public service, and offering his schooner to the Government as a gun-boat.

Hayes' book is written in delightful language, but grave doubts have been cast upon the extent of his discoveries. It was afterwards found that Lady Franklin Bay was 6 degrees farther east than Hayes placed it, and the description given by Hayes of his farthest north does not agree with what is seen in the neighbourhood of Lady Franklin Bay.

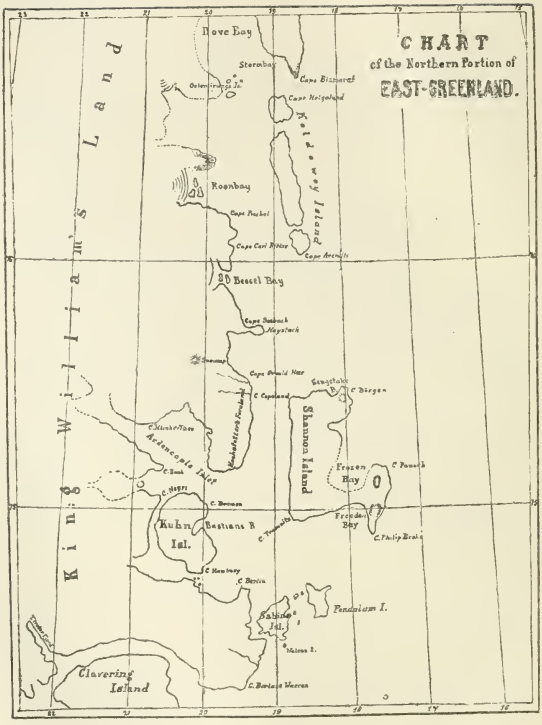


CHART
of the Northern Portion of
EAST-GREENLAND.
King William's Land
Hove Bay
Sternbay
Cape Bismarck
Cape Neigenland
Kolderup Island
Roosbay
Cape Parbel
Cape Carl Ritter
Cape Arendrup
Bessel Bay
Cape Sabine
Cape Arnold Mar
Cape Copeland
Shannon Island
Frozen Bay
Kuhn Isl.
Bestians B
Pandanium I.
Kahlke Isl.
Clavering Island
C. Berlin Warren

CHAPTER IV

THE GERMAN EXPEDITION (1869–70)

The German Expedition left Bremerhaven on 15th June 1869. There were two boats—the *Germania* and the *Hansa*. The expedition was to make the east coast of Greenland and then penetrate to the north as far as possible.

The ice was reached on 15th July. On the 20th of July the two ships were separated through a misunderstanding, and they never met again.

From the 20th of July till the end of August the *Hansa* struggled through the pack-ice which drifts along the coast of Geeenland. According to instructions, it was to attempt to reach Sabine Island, but that was found impossible. At the end of August it became fast in the ice, and drifted south.

On the 27th September the crew of the *Hansa* began building a house with coal-tiles on the floe. It was 20 feet long, 14 feet broad, and 6½ feet in the gable, while the side walls were 4 feet 8 inches high. For cement, powdered snow was used, and over this water was poured, which soon froze the whole into a compact mass.

About the middle of October the *Hansa* was wrecked by the pressure of the ice. It sprang a leak and slowly sank, and the crew had sufficient time to save a good many necessary articles which were stacked round the house on the floe.

The ice-field slowly but steadily drifted to the south.

By the 3rd of November it had passed the Liverpool coast, and had reached Scoresby's Sound. A walrus and several bears were shot, and supplied the party with fresh meat. November and December passed, and nothing particular happened. Christmas was spent in quite an enjoyable manner, after the German fashion. On the 2nd of January 1870 a storm arose, and when it was over it was discovered that half of the floe had been destroyed. On the 11th another storm did great damage, and greatly reduced the size of the floe. A huge gap opened in the ice near to the house, and all the firewood drifted into the raging sea. The floe was now only 150 feet in diameter, but during the night the masses of ice became closely packed again. On the 14th another frightful storm was experienced: a fissure opened in the ice under the house and the roof fell in, but fortunately the inmates all escaped. Some shelter was obtained in the boats during the next five nights, until a new house half the size of the old one was built. This house had sleeping-room for only six men, so that from this time the remainder had to sleep in the boats. It was not until the 7th of May that the opportunity came to leave the floe in their boats. They had spent 200 days on the ice. On the 4th of June they succeeded in reaching the island of Illuidlek. They left the island on the 6th and made for Friedrichsthal, the nearest colony on the south-west coast of Greenland, which was reached on the 13th of June, and where they received a hearty welcome. After a few days here, they journeyed to Julianashaab, about 80 miles distant, from which they obtained a boat for Europe.

After parting with the *Hansa* on the 20th of July, the *Germania* battled with the ice in various latitudes, and after great difficulties succeeded in reaching Sabine Island on the 5th of August.

Sabine Island is one of the Pendulum Islands discovered by Clavering in 1823. The *Germania* finally wintered in a little bay in the south-east corner of the island, after making a trip to the north of Shannon Island.

Several short sledging expeditions were made before winter set in, but the main expedition to the north was made in the following spring. Musk-oxen were plentiful, and several bears were shot. Deserted Esquimaux huts were found, but no natives were seen by the Expedition.

The party had several serious adventures with bears. One of them is thus described:—"Theodor Klentzer climbed the Germaniaberg to view the landscape in the increasing midday light. Reaching the top, he seated himself on a rock, and sang a song in the still air. As he looked behind him, however, he saw, not many steps off, a huge bear, which with great gravity was watching the stranger. Now, to our 'Theodor,' who was as quiet and decided a man as he was powerful, this would, under other circumstances, have been nothing; for the bear stood wonderfully well for a shot, and could not easily be missed; but Klentzer was totally unarmed, not having even a knife. Incredible! is it not? But, as Lieutenant Payer writes, 'the bears always come when one has forgotten all about them.'

"Thus Klentzer saw himself unarmed and alone, far from his companions, and close to the bear. Flight was the only, though a doubtful, chance of safety, and the audacious thought struck him of plunging down the steep side of the glacier; but he chose the softer side-slope, and began to hurry down the mountain. Upon looking back, after a time, he perceived the great bear trotting behind him at a little distance, like a great dog. Thus they descended the mountain for some time. If Klentzer halted, so did the bear; when he went on, the

bear followed slowly; if he began to run, the bear did the same. Thus the two had gone some distance, and Klentzer thought seriously of saving himself, as the bear, finding the chase somewhat wearisome, might press close upon his heels. He therefore uttered a loud shout, but the bear, only disconcerted for a moment, seemed to get more angry and approached quicker, so that he seemed to feel the hot breath of the monster. At this dreadful moment—and it was most likely his preservation—he remembered the stories he had heard, and while running, pulled off his jacket, throwing it behind him. And see! the trick answers: the bear stops and begins to examine the jacket. Klentzer gains courage, rushes on down the mountain, sending out a shout for help, which resounds through the silent region. But soon the bear is again at his heels, and he must throw away cap and waistcoat, by which he gains a little. Now Klentzer sees help approaching — several friends hurrying over the ice. Collecting his last strength, he shouts and runs on. But help seems in vain, for the pursuer hurries too, and he is obliged to take the last thing he has, his shawl, which he throws exactly over the monster's snout, who, more excited still by renewed shouting, throws it back again contemptuously with a toss of the head, and presses forward upon the defenceless man, who feels his cold black snout touch his hand. Klentzer now gave himself up for lost; he could do no more; but the wonderful thought struck him of fastening up the bear's throat with the leather belt which he wore round his body. Fixedly he stared into the mercileſs eyes of the beast—one short moment of doubt—the bear was startled, his attention seemed drawn aside, and the next moment he was off at a gallop."

Another bear incident had a more serious ending:—

"We were sitting (writes Lieutenant Payer) fortunately

silent in the cabin, when Koldewey suddenly heard a faint cry for help. We all hurriedly tumbled up the companion-ladder to the deck, when an exclamation from Börgen, 'A bear is carrying me off!' struck painfully on our ears.

"It was quite dark; we could scarcely see anything, but we made directly for the quarter whence the cry proceeded, armed with poles, weapons, etc., over hummocks and drifts, when an alarm-shot, which we fired in the air, seemed to make some little impression, as the bear dropped his prey and ran forward a few paces. He turned again, however, dragging his victim over the broken shore-ice, close to a field which stretched in a southerly direction. All depended upon our coming up with him before he could reach this field, as he would carry his prey over the open plain with the speed of a horse, and thus escape. We succeeded. The bear turned upon us for a moment, and then, scared by our continuous fire, let fall his prey.

"We lifted our poor comrade up on to the ice, to bear him to his cabin—a task which was rendered somewhat difficult by the slippery and uneven surface of the ice. But after we had gone a little way, Börgen implored us to make as much haste as possible. On procuring a light, the coldest nature would have been shocked at the spectacle which poor Börgen presented. The bear had torn his scalp in several places, and he had received several injuries in other parts of his body. His clothes and hair were saturated with blood. We improvised a couch for him in the rear of our own cabin, as his own was not large enough.

"The first operation was performed upon him on the cabin table. And here we may briefly notice the singular fact that, although he had been carried more than 100 paces with his skull almost laid bare, at a temperature of

−13° F., his scalp healed so perfectly that not a single portion was missing."

Börgen's narrative was as follows:—

"About a quarter before 9 p.m. I had gone out to observe the occultation of a star, which was to take place about that time, and also to take the meteorological readings. As I was in the act of getting on shore, Captain Koldewey came on to the ice. We spoke for a few moments, when I went on shore, while he returned to the cabin. On my return from the observatory, about 50 steps from the vessel, I heard a rustling noise to the left, and became aware of the proximity of a bear. There was no time to think, or to use my gun. The grip was so sudden and rapid that I am unable to say how it was done; whether the bear rose and struck me down with his fore-paws, or whether he ran me down. But from the character of the injuries I have sustained (contusions and a deep cut of the left ear), I conclude that the former must have been the case. The next thing I felt was the tearing of my scalp, which was only protected by a skull-cap. This is their mode of attacking seals, but, owing to the slipperiness of their skulls, the teeth glide off. The cry of help which I uttered frightened the animal for a moment; but he turned again and bit me several times on the head. The alarm had meanwhile been heard by the captain, who had not yet reached the cabin. He hurried on deck, convinced himself that it was really an alarm, roused up the crew and hastened on to the ice, bringing assistance to his struggling comrade. The noise evidently frightened the bear, and he trotted off with his prey, which he dragged by the head. A shot fired to frighten the creature effected its purpose, inasmuch as he dropped me, and sprang a few steps aside; but he immediately seized me by the arm, and, his hold proving insufficient, he seized me by the right hand, on which was

a fur glove, and this gave the pursuers time to come up with the brute, which had by its great speed left them far behind. He was now making for the shore, and would certainly have escaped with his prey, had he succeeded in climbing the bank. However, as he came to the edge of the ice, he turned along the coast-side, continuing on the rough and broken ice, which greatly retarded his speed, and thus allowed his pursuers upon the ice to gain rapidly upon him. After being dragged in this way for about 300 paces, almost strangled by my shawl, which the bear had seized at the same time, he dropped me, and immediately afterwards Koldewey was bending over me with the words, 'Thank God! he is still alive!' The bear stood a few paces on one side, evidently undecided what course to pursue, until a bullet gave him a hint that it was high time to take himself off.

"No one thought of pursuing him, for their first care was to carry the wounded man on board, whither the doctor and Herr Tranmitz had gone in order to prepare the requisites for binding up the wounds. The main injuries were in the head, where, amongst numerous other wounds from the bites, two especially from 4 to 6 inches long ran along the scalp, the edges of which hung loose, leaving the skull bare for one-third to two-fifths of an inch. The other wounds, about twenty in number, were in part caused by striking against the fragments and rough broken edges of the ice. It is worth while mentioning that, neither during the act of receiving the wounds nor during the process of healing, which progressed favourably, did I experience the smallest pain."

The sledge-journey to the north left on the 8th March 1870. The party consisted of ten men, and they had two sledges. The smaller sledge had four men who were to accompany the expedition for a week, and then return after laying a dépôt. A storm and the low temperature

forced them to return to the ship a few days after leaving.

On the 24th March they started again. During the first day one of the men had the whole of his right foot frost-bitten, and the convoy-sledge had to return to the ship. A herd of musk-oxen was seen on Hochstetter's Promontory, but none was shot. A bear was killed on the 4th of April, and supplied the party with meat, and his fat served as fuel four days. On the 6th of April they crossed the 76° of latitude, and on the south side of Cape Karl Ritter discovered traces of Esquimaux summer tents. On the 11th April, Cape Bismarck in 76° 47′ was reached, and this was the end of the actual sledge-journey. Leaving their tent here, they journeyed to a mountain in 77° 1′ north latitude, and 18° 50′ west longitude, where a cairn was erected. Provisions were now running short, and they were compelled to return. Two musk-oxen were shot at Cape Bismarck. Like many of the other expeditions about this period, they suffered greatly from want of snow-shoes, and frequently had to wade through snow up to the thighs. The difficulties of such a sledge-journey are well described by Lieutenant Payer:—

"Amongst other disagreeables of an Arctic sledge-journey is its monotony. The ideas and wishes contained within the limited horizon of life in the Arctic world pass as quickly away as the eye is wearied by the monotony of the landscape.

"Conversation carried on by men straining at the traces can certainly not be very animated. The frost prevents smoking, for the pipes freeze. There is a continued conflict against the loss of warmth; and the cold penetrates in a hundred different ways. Now the chin is numbed, a painful straining of the forehead sets in, or a violent pricking of the nostrils, which are exposed to the wind. Sometimes one stands in danger of the heels, the

toes, or the hands being frost-bitten. The hair of the face, and even the eyelashes, get hoar with frost,—indeed, the eyes are often completely closed,—and every frozen spot on the body must at once be rubbed with lumps of snow resembling pumice-stone, until a warm, pricking glow succeeds. When, as in the case of many of our party, the frozen hands or feet were not rubbed with snow until too late, it led to numerous blisters. The fingers swelled up into lumps, and became quite numbed; but the noses (the whole eight of which were frozen) were more fortunate: they emerged from a white into a red stage of enlarged dimensions, were eventually covered with a parchment-like skin, remaining for some time most sensitive, and by slow degrees regained their normal condition, so that by the time we landed in Europe they were all right again. The heat of our bodies, which we did our best to retain by warm woollen clothes, was carried away in a moment by the slightest wind; and if it increased, the cold crept between every button of our seal-skin clothing; the penetrating icy wind was felt at every stitch; the arms hung down like lead, deadly cold, and no one dared to walk about without a mask. If the wind rose still more, curtains of penetrating snow-crystals rose with it from the ground; then a snowstorm, which always comes from the north, might be expected, announcing itself by a lofty white appearance in the south, the violet colour and close proximity of the mountains, and low-hanging clouds. But still we risk the march forward against the thickening snow, until painful breathing and stiffening limbs warn us to pitch our tent.

"Under ordinary circumstances this was done about 6 or 7 p.m., on a smooth surface. A hole was quickly dug with shovels, on which the tent was erected, and the dug-out blocks of snow laid round it for safety against the storm, and the sledge placed as a shield to the north.

The tent was kept upright by means of four long poles, each crossed at the top, stretched by ropes fastened to axes or piles driven into the ground. When the sleeping-sack had been laid down in the tent, our personal baggage settled, the kettle filled with blocks of snow by the cook, the lamp lit, and the rations given out, our comrades, who, owing to the increased cold since the setting of the sun, had meanwhile been running and jumping to keep themselves warm, were allowed to enter.

"During our last half-hour's march, each man had been busy thawing his beard with his hands, for it had been changed into a lump of ice, so that it might not melt whilst the cooking was going on, and so wet their clothes and coverings. As soon as all were in their places in the tent, the aperture was closed, and preparations made for passing the night.

"The stiff sail-cloth boots, fast frozen to the stockings which were to form our pillows, were thawed between the hands, and with difficulty taken off; the stockings, thick with rimy snow, were scraped, then wrung and laid upon the breast, to dry by our only available means—our bodily heat—so as to prepare them for the following day's work.

"At last all have wriggled themselves into the sleeping-sack, each one lying partly on his neighbour, and in this modest space waiting for the evening meal.

"The first hour is spent in melting the snow, the second in preparing the meal, which is devoured eagerly, and as cool as possible. The development of steam during the cooking (which in the very cold weather consumed one bottle of spirit, or 1 lb.) put us into such a vapour-bath that we could not even see our next neighbour; the tent walls were completely wet through; and the temperature rose rapidly. The dampness of the coverings and clothes, from the condensation of the steam on the rime, of course increased, and the opening of the tent door occasioned a

fall of snow within, so that by the time the cooking was over, all was covered with a thick coating of ice or crust of snow.

"It is about eight or nine o'clock: the small rations of boiled beef, soup, and vegetables are no longer enough to allay the daily increasing hunger; but sleep buries that, as well as our burning thirst, in oblivion. Only occasionally did our sparing supply of spirits allow us to prepare an extra quantity of water.

"During the march each one carried an india-rubber or tin bottle full of snow, on his bare body, turned as much as possible to the sun, and often after many hours only a few spare spoonfuls (and sometimes nothing) could be obtained from it.

"Last of all, the cook, after cleaning out the kettle, also fights his way into the sleeping-sack, which thus attains its proper complement. A side position is the only one possible—to-night all lie to the left, to-morrow all to the right. Comfortable positions, such as stretching on one's back for example, meet with a miserable protest, as well as any other after-movement; and when at length silence falls upon all, the eight men form one single lump.

"The nose acts no longer merely as a condenser, as on the spring journey; it now becomes a cold-pole, and leaving it outside the rimy and icy covering is preferable to burying it in the questionable atmosphere of the sack. The mouth, as the only outlet of exhalation, must remain open, but the teeth get so cold that they feel like icicles, and the mask, which it is necessary to wear in the night, freezes to the long beard.

"Happy were those who, during the lowest temperature within the first fourteen days of our journey, could really lose themselves during the hours of rest, if only for a short time, for they were generally passed in a painful waiting for a happy release, by—dragging!

"This general wakefulness made it unnecessary to set a special watch for bears and foxes, which occasionally made a bold raid upon the stores in the sledge, for they had never yet succeeded in approaching us quite noiselessly.

"In spite of all efforts to the contrary, the cutting cold too soon penetrated the sleeping-sack; within the tent the temperature sinks from 60° or 65° to below zero, and the body has to be again refreshed with artificial warmth, by motion and hot food.

"The natural consequences of this state of temperature is a continually increasing sensation of freezing until the morning. During the day the sack has got thoroughly cold on the sledge, and must again be warmed by bodily heat, being frozen into thick folds as hard as iron. Whoever lies upon these seems to be lying on laths, which towards morning begin to lose their sharpness. One or the other, we keep a bottle of snow about us. All are shivering, scarcely any sleep. For hours together we are in a state of suffocation, the pressure on either side causing a feeling as though the collar-bone was being forced into the chest and the shoulders crushed. Each lies upon his arm (which of course goes to sleep), and is often prevented from breathing by the smell of train-oil proceeding from his neighbour's seal-skin. The breath condenses over the face and upon the sloping tent-side, in long snow-webs, which fall at the slightest movement.

"The misery of tent-life reaches its maximum during an uninterrupted snowstorm of sometimes three days' duration. So long as this assumes the form of a hurricane, no one can leave the tent without danger of either being suffocated or blown away. These Greenland snowstorms, which carry small stones with them, greatly resemble West Indian hurricanes, only that the sun is completely darkened by the rush of snow.

"Of course our tents would soon have been blown over, if some precautions had not been taken. Great distress reigned within. The wind greatly lessened the already small space by pressing in the walls. Through the canvas, through every stitch or smallest opening, spurts a small flood of the finest snow, like flour out of a flour-mill, or collects itself on the inner surface, where its ever-increasing weight at length brings it down like small avalanches. As long as the storm rages the cold is alleviated from the equalisation of warm air over the sea, though it seldom allows any heat to remain in the tent, so that we were still in a cold of from 14° to 5° F.

"By degrees a covering of snow at least an inch thick lies on the sack, under which we must patiently wait till the storm ceases. We scrape it away with the knife, but it soon returns again. On some occasions this snow began to melt, and penetrate the clothes, making us look like seals coming up out of the water.

"In a steadily rising temperature, too, the snow on which we lay would melt, and the sack get wet underneath, not to dry again till the summer, but freeze on the sledge in those hard folds we dreaded so much. We repeatedly felt the want of india-rubber coverings.

"This state of things often lasted from two to three days, and we waited with an indifference bordering on stupidity, sitting squeezed, with numbed hands, mending the gloves or stockings, almost freezing, masked; beards full of ice, stuffed up with a chaos of frozen clothes and boots, and, worst of all, fasting. The duration of the journey, as well as the extent of country to be explored, depended upon the use of the provisions. If, therefore, some part of the time was lost through storms, this loss, in spite of hunger, thirst, and loss of strength, could only be regained by reduced rations, which often only consisted of a thin soup.

"The saucepan has become leaky, a small sea has formed on the sack, the spirit-lamp runs, and repeatedly threatens to destroy the tent by fire, which, during the storm, would be the work of a moment. The cook grumbles, burns his fingers to-day which were frozen yesterday;—urged on by hunger, his cooking is subject to sharp criticism, as each is waiting for the eventful moment when the meal shall be ready.

"All food was frozen—even brandy began to freeze one night—meat in the tins or ham had to be chopped with the axe; butter could, without any fear, be carried in the waistcoat-pocket, to be enjoyed on the march.

"Woe to the unfortunate man who, in a lull of the storm, goes into the open air. He is almost torn to pieces, stifled by the snow-filled air, betrayed into snow-drifts, and yet not daring to open his eyes. Numbed with cold, white as a miller, he returns to the tent. Here he is a subject of horror to his neighbours in the sack, whom he intends robbing of their warmth to thaw himself. The snow-powder blown in upon the opening of the tent door has penetrated through all the clothes, and the skin has to be scraped and any frost-bites that may have set in have to be dispersed by rubbing. Indeed, the disturbance and excitement consequent upon a walk in the open air does not subside for some hours.

"But the snow-blind suffer the most from such a state of things. Out of consideration to them, smoking was dropped.

"The irritation caused by the white snowflakes, which with us are easily beaten aside, cause great suffering in Greenland, from the inflamed state of the eyes and the thick heavy atmosphere, to those who may have been unfortunate enough to break their snow-spectacles.

"Beating them off while on the march is impossible, for the damp cloth freezes at once to a lump of ice, making the eyes insupportably cold. The simple bandage, on the

other hand, does not save one from the steady burning pain, which acts like needle-pricks. Opening the eye for a moment is not to be thought of. The blind are obliged to pull with the others, as the laden sledge cannot be moved but by our united strength.

"As a rule, we break up about 5 a.m. The thin black coffee is taken with some ice-cold bread-dust, which effectually destroys all its warming properties, mixed into it like a mash, and then follows laborious packing up of the clothes, in order to be prepared for all weathers. The frozen boots must first be thawed with the hands, and the folds taken out, the tent freed from snow, and beaten until pliable. The sleeping-sack receives the same treatment, which, as a sign of our disgust and its daily increasing weight from the ice, we named 'the Walrus.'

"The soaked seal-skin clothing freezes at once in the air, and damp condenses on the hair in frost-blossoms. One or the other rubs his face with scraped snow to refresh his eyes—a novel kind of washing, in default of water, though with the slightest breath of wind his hands are in danger of freezing. After every snowstorm, tent and sledge have to be dug out, and the contents cleaned with difficulty.

"All this business occupies about two hours, when the traces are taken up with great satisfaction, as a long-looked-for release from the pain of the nightly couch. The sledge is loosened from its frozen position, and the journey continued, which, after twenty-three days, brought us to 77° of latitude, the most northerly point ever reached on the east coast of Greenland."

The coast along which this sledge-journey was made was found to be much broken up, and the opinion was formed that the land might possibly resolve itself into a group of islands.

The ice having broken up, the *Germania* left its winter

harbour on 22nd July, and steamed northwards. In 75° 29′ it was stopped by ice, and had to return to the south. Kaiser Franz-Joseph's Fjord was afterwards explored; and on the 17th of August the return home to Germany was begun. By the 25th of August they were clear of the ice.

"On the 10th of September we were a few miles from Heligoland. A heavy storm blew from the south-west, but in the evening shifted to the north-west, enabling us to run in to shore. At daybreak, though we had seen no pilot, we recognised Langerooge, and steered along the South-wall to the mouth of the Weser. No sign of a ship! The Weser seemed to have died out. Where are the pilots hidden? Are they lying *perdu* on account of yesterday's storm? Well, then, we must run into the Weser without them; the wind is favourable, the weather clear, the outer buoy will be easy to find; there is the church-tower of Wangerooge. Suspecting nothing, we steered on; the tower bears S.S.W., south-west by south, south-west, but no buoy in sight. The captain and steersman look at each other in astonishment. Can we have been so mistaken and out of our reckoning? But no! That is certainly Wangerooge; the depth of water agrees, our compass is correct. No doubt about it, we are in the Weser; something unusual must have happened! Still no sail in sight! But what is that? Yonder are the roads. There are several large vessels under steam; they at least can give us some information. So we make for them. We saluted the German flag, and soon the cry was heard, 'War, war with France; Napoleon is prisoner! France has declared a Republic; our armies are before Paris!' And then, '*Hansa* destroyed in the ice, crew saved.'"

CHAPTER V

VOYAGE OF THE *POLARIS* (1871–73)

Captain Charles Francis Hall, after having dwelt with the Esquimaux about eight years, during which he lived like one of them and acquired their language, returned to America in 1869.

He had a great ambition to reach the spot "where there is no North, no East, no West." Early in 1870 he began his agitation for an expedition to the North Pole. He lectured in various parts of the United States, and received encouragement from the Hon. George M. Robeson, Secretary of the United States Navy. Ultimately a wooden river gun-boat of 387 tons, called the *Periwinkle*, was given to Hall, and was afterwards rechristened *Polaris*. Congress also granted 50,000 dollars.

Hall, who was not himself a seaman, engaged Captain S. O. Budington as sailing-master. Captain Budington had made thirteen whaling voyages to Baffin's Bay, and was therefore an experienced ice-navigator. Dr. Bessels was naturalist, and Mr. Meyer meteorologist. Morton, of Kane's expedition, also accompanied Hall. Mr. Grinnell, the munificent promoter of expeditions for the search of Franklin, presented Hall with the flag which, in 1838, had been with Wilkes to the Antarctic regions, and which had since been in the northern Polar seas with De Haven, Kane, and Hayes.

Hall's first intention was to proceed up Jones Sound, but his opinion regarding this route changed before he left the States. He trusted chiefly to dogs for his sledge-travelling, and did not expect to reach a higher latitude than 80° during the first year.

The *Polaris* left New London on 3rd July 1871, and St. John's on 19th July. The coast of Greenland was first seen on 27th July, and Upernavik was reached on 19th August. Here Hans, of Kane's and Hayes' expedition, was engaged as dog-driver and servant, and received a salary of 300 dollars per annum. His wife and three children, who were dressed in ragged and filthy skin clothing, accompanied him. Their luggage consisted of tents, tools, cooking utensils, implements of the chase, and three or four puppies whose eyes could scarcely bear the light.

The *Polaris* was first stopped by the ice off the western shore of Hakluyt Island, about 5 a.m. on the 27th August, but by forcing ahead, open water was reached the same day. At 3 p.m. on that day the *Polaris* was opposite Cape Alexander; at 5 p.m. it was off Littleton Island; Cairn Point was passed at 6.30; and at 8 p.m. the parallel of Rensselaer Harbour was reached.

Smith Sound was found quite open. At midnight a heavy pack was seen, but in about two hours its south-western point was rounded. At 3.30 a.m. on the 28th, Cape Hawks was on the port beam, about 15 miles distant.

The width of the southern entrance of Kennedy Channel was estimated to be about 35 miles, and it was found to narrow towards the north to about 25 miles.

The highest latitude, estimated by Hall to be 82° 26′, but afterwards corrected to 82° 11′, was reached at 6 a.m. on the 30th August. Hall had therefore passed from Cape Alexander, at the entrance of Smith Sound, to his highest

point in Robeson Channel, in about two and a half days. He had carried his ship much farther north than any ship had ever reached before.

The barrier of ice had now been reached, and it became necessary to search for a harbour. Steaming southwards, a little bay was seen, but after two attempts to enter it, Hall had to acknowledge defeat. He named it "Repulse Harbour."

Budington wished the *Polaris* to take winter quarters in Newman Bay, but Hall decided to try and reach the west coast. After boring for a distance of 12 miles, the *Polaris* was beset, and was not released until the 4th September, when a course was made for the eastern shore. On the 5th September the anchor was dropped about 300 yards from shore, in latitude 81° 37′, and about 4 miles south of Cape Lupton.

Hall named Robeson Channel after the Secretary to the Navy, and the Harbour was named "Thank-God Harbour."

A large quantity of provisions and stores was now landed, and preparations were at once made to explore the surrounding neighbourhood.

Traces of Esquimaux were soon found; and on the 6th September, Hall and some of his companions ascended Cape Lupton, from which Robeson Channel could be seen as far as Cape Union. The bay extending from Cape Lupton to Cape Budington was named "Polaris Bay."

A hunting-party was sent out on 18th September. It returned on the 23rd, and reported having killed a musk-ox. This was very interesting news, as it was the first musk-ox ever seen on the west coast of Greenland.

On 10th October, Captain Hall, Mr. Chester, and the Esquimaux Joe and Hans started on a sledge-journey towards the north. On the 15th, Hall camped in sight of a bay which he named "Newman Bay." On the 18th,

Hall and Mr. Chester ascended to the top of Cape Brevoort, situated on the north side of this bay. The return journey was made from this point.

During this journey the party slept in snow-houses. They returned to the ship on 24th October. All were well with the exception of Captain Hall. He complained of not having his usual amount of energy. Soon after his return he became sick and vomited a good deal. Dr. Bessels announced that same evening that Hall's left side was paralysed and that he had had an apoplectic attack. On the 29th he had marked symptoms of insanity, and believed that an attempt was being made to poison him. However, by the 6th November he had largely recovered, but at night he again became alarmingly ill. On the 7th he became comatose, and died on the morning of the 8th November. On the 10th November he was buried on the shore of Polaris Bay, and a wooden monument was erected over his grave.

It was a sad and unexpected ending to a life full of high hope.

On the death of Captain Hall, the command devolved upon Captain Budington.

On the 18th November a severe gale began. It increased in violence on the 19th, until the wind reached 52 miles per hour. It continued on the 20th and 21st, and on the latter date the *Polaris* was found to be afloat. With great difficulty the ship was secured to a large grounded iceberg which was named "Providence Berg." The *Polaris* was thus saved from being carried into the pack.

Nothing of special interest occurred during the remainder of the winter. In March 1872, Joe the Eskimo, in one of his hunting expeditions, discovered Petermann's Fiord.

On 27th March a sledge-party in charge of Dr. Bessels

set out with the object of reaching Cape Constitution, Morton's farthest, and ascertaining its correct position. The party reached within 30 miles of the cape, but had then to return.

The whole expedition were anxious to explore the region to the north, but the strange conclusion was arrived at that it was necessary to proceed in boats. The idea of the "open sea" had evidently some influence with them. When a small channel formed it gave rise to high hopes that a start with the boats would be made, but these hopes were soon dashed when the channel closed again. Instead of setting out with sledge-parties along the coast, the spring and part of the summer were allowed to slip away while they waited for open water. Yet they were in a more favourable position for making an advance towards the north of Greenland than any party before or since.

On the 8th June a start was made from Cape Lupton with a boat, which had previously been taken there, but it was crushed in the ice next day.

Another start was made on the 10th with two boats, and the party succeeded in reaching Newman Bay without much difficulty, but found it impossible to proceed farther north with the boats.

During the month of June the *Polaris* leaked badly, and the pumps had to be kept frequently at work. On the 26th of this month the ship was liberated from the ice by means of saws, and Budington at once determined to start for the north. On approaching Cape Sumner, however, the pack was found to be impenetrable. After crossing to Cape Lieber without finding an opening, the *Polaris* returned to "Thank-God Harbour." On the 28th June, Budington received the news that the boat-party was at Newman Bay, and he attempted to take the *Polaris* north so as to pick up the boats, but the

pack was again met at Cape Sumner. He then sent instructions for the boat-party to return. The boats were abandoned at Newman Bay, and the last of the party returned to the *Polaris* on 22nd July.

At the beginning of August, Budington determined to start towards the south as soon as an opportunity presented itself. This occurred on the 12th August at 4.30 p.m. Next day a close pack was met, and the *Polaris* was fastened to a large floe and allowed to drift slowly down the channel. Cape Constitution was passed on the 14th. During the rest of the month, and throughout the whole of September, the drift southward was very slow. On the 12th October the *Polaris* was within 2 miles of Cairn Point, and on the 14th Northumberland Island was visible. During September and October a house was built on the floe.

On the 15th October a severe gale sprang up, and preparations had to be made in case it was found necessary to abandon the ship. During her drift southwards the *Polaris* had been nipped several times, and was leaking badly. During this gale she was again nipped so severely that Budington ordered provisions and stores to be thrown upon the ice. The Esquimaux women and children took refuge on the floe. While some of the crew were carrying articles to a safe place on the floe, the *Polaris* was suddenly drifted away from the ice. So quickly did this catastrophe take place that the floe-party soon disappeared from view.

Budington now called all hands to muster, and found that fourteen men remained on board. The *Polaris* drifted rapidly until toward midnight, when she ran into some young ice, and her progress was stayed. Next morning the ship's position was found to be half-way between Littleton Island and Cairn Point. No trace of the missing party could be seen. Later in the day the

Polaris reached the coast, and was secured with heavy hawsers to large grounded hummocks.

On the 19th October two Esquimaux appeared at the ship, and on this date it was decided to build a house on shore. More Esquimaux arrived on the 21st, and they gave great assistance in sledging articles to the shore. The house was soon erected, and was used by the party throughout the winter. Large numbers of Esquimaux made frequent visits, and were very friendly with the party during the whole time of their stay.

Towards the end of February 1873 it was decided to begin the construction of two boats in which the party intended to make a retreat to the Danish settlements.

On the 30th May almost all the land-ice broke away, and with it the *Polaris* went adrift. She was carried about 200 yards towards the south, when she again grounded. At high tide her upper deck was 2 feet under water.

On the 3rd June 1873 the party set out for the south in their two boats. On the 23rd of this month, in Melville Bay, not far from Cape York, they were gladdened by the sight of a whaler. It turned out to be the *Ravenscraig* of Kirkcaldy, Scotland, owned by Ninian Lockhart, and commanded by Captain William Allen. The *Polaris* party were enthusiastically received, and were treated with the greatest kindness. They were ultimately taken to Dundee.

We must now return to the party on the floe. It consisted of ten Americans and nine Esquimaux. The Americans were Tyson, Meyer, Herron, Jackson, Kruger, Jamka, Nindemann, Aunting, Lindqvist, and Johnson. They had two boats, two kayaks, a canvas boat, and some navigation instruments, besides a moderate quantity of provisions.

Next day, after their separation from the *Polaris*, the

floe on which they were was found to be near Littleton Island. The party took to their boats, intending to make for the land and to look for the *Polaris*, but a breeze sprang up and obliged them to haul the boats on the ice. Soon after this, the *Polaris* was seen rounding a point 8 or 10 miles away. Signals were made, but were not noticed by those on the vessel. After this, the floe drifted away from land towards the west coast, then across to the neighbourhood of Northumberland Island, and finally southwards to the east of the Carey Islands.

The Esquimaux during this time were successful in capturing a number of seals. The provisions were served out by weight, 11 oz. being a day's allowance.

During October three snow-houses were built. By November the temperature became very low, and the effects of exposure and want of food began to tell on the party. Some of the men trembled when they tried to walk, and the Esquimaux children often cried with hunger, although all was given them that could possibly be spared. The services of Joe and Hans were invaluable: without them, the chances of life would have been very much diminished. So keen had the appetites of the party become that the seal-meat was eaten uncooked, with the skin and hair on.

On the 7th December the latitude of 74° 4′ was reached. During this month the allowance of food was 16 oz. Christmas was celebrated by an extra meal. At breakfast, an additional ounce of bread made the soup a little thicker than usual. New Year's Day did not pass so well. One of the party described the dinner as "mouldy bread and short allowance." Captain Tyson stated that he had dined "on about 2 feet of frozen entrails and a little blubber."

On the 6th January 1873 the latitude was approximately 72° 7′. On the 15th of this month the

temperature went down to 40° below zero. On the 19th, the sun reappeared after an absence of eighty-three days.

On the 21st February the rations were reduced to 7 oz., so that they might last till April. At the beginning of March the temperature was over 30° below zero, and food was scarce. On the 2nd of the month Joe was fortunate in shooting a large seal, an "ookgook," and it can be imagined with what delight the starving party received it. They feasted on it till most of them became ill. Soon after this seal was captured a storm came on, and it was feared that the floe would break up: the noise of the ice was like that of artillery. All the party remained dressed and ready in case of sudden disaster. After the gale began to moderate, it was found that the ice all around had been broken up, and that the piece on which they were was now only about 175 yards in size.

On the 12th March the latitude was found to be 64° 32′. On the 27th of this month a bear was shot. This was very much appreciated: the flesh was compared to pork. On the last day of March the latitude was about the same as Cape Farewell—the most southern point of Greenland.

On the 1st April it was found necessary to abandon the floe and take to the boat. When all the party entered, the boat was found to be overloaded, and 100 lb. of meat and nearly all the clothing had to be thrown overboard. During the next few days the party were kept continually launching and then hauling up the boat on the ice. On the 7th April the ice split across the tent; the party managed to save themselves, but lost their breakfast. Next day the ice split between the tent and the boat, and it was only with great difficulty that the latter was secured.

During the next eight days they were imprisoned on the ice, and the amount of food ran very low. On the

18th April a seal was shot by Joe and was eaten raw. Next day a sea struck the floe on which they were camped and washed away the tent, skins, and most of the bedclothing. It was with the utmost difficulty that the men prevented the boat from being lost. They held on to the boat from 9 p.m. till 7 next morning. During this time many of them were frequently struck by blocks of ice and severely bruised. On the 22nd April they were saved from starvation by the capture of a bear.

At 4.30 p.m. on the 28th April a steamer hove in sight, but failed to see them. Next day another steamer was seen, but after the party believed they were observed, it changed its course and disappeared. On the 30th April, on some fog clearing away, they were overjoyed to see a steamer close at hand. Shots and shouting soon attracted attention, and in a few minutes it was alongside. The vessel was the sealer *Tigress*, Captain Bartlett of Newfoundland. The party were picked up in latitude 53° 35′, off Grady Harbour, Labrador.

The return to civilised life and its food and comforts was attended with swollen legs and feet, diarrhœa, and severe headache. The *Tigress* landed the party at St. John's on 12th May.

The voyage of the *Polaris* extended considerably our knowledge of the Smith Sound route towards the Pole. It also did much to explode the theory of an open Polar Sea. The *Polaris* was carried to a more northern point than a vessel had ever before reached, and it prepared the way for the British Expedition of 1875.

One might naturally suppose that the Arctic regions would offer no further attractions to those who suffered the terrible experience on the drifting ice, but it will be afterwards seen that at least one of the party played a noble rôle in another American Expedition which met with disaster.

KAISER FRANZ JOSEF LAND AS KNOWN IN 1874.

CHAPTER VI

THE AUSTRO-HUNGARIAN EXPEDITION (1872–74)

The failure of the second German Arctic Expedition to reach a high latitude on the east coast of Greenland directed attention to the seas of Novaya Zemlya. In order, however, that large sums of money might not be spent on a plan which might be unfeasible, it was decided to dispatch a pioneer expedition under the joint command of Lieutenant Weyprecht and Julius Payer. The latter had greatly distinguished himself in the German Expedition.

In order to diminish expenses, a small sailing ship, the *Isbjorn*, of 55 tons, was chartered at Tromsoe. She was new and strong, and this was her first voyage. Her bows were protected with sheet iron, 2 feet above, and 2 feet under, water. The crew consisted of eight Norwegians.

Tromsoe was left on the 20th June 1871. They were detained two days at Sandoe by contrary winds, and on the 28th the first ice was met in 73° 40′ south-east of Bear Island. Here they passed through 40 miles of loose drift-ice, and then met the pack in 74° 30′. Calms set in, and the *Isbjorn* was beset for ten days. On the 10th July it escaped and sailed eastward. They reached longitude 40° E., and then were forced to return westward. Hope Island was reached, and the course was then directed north, but ice was met with in 76° 30′. Three attempts were made to reach Stor-Fiord from the western side of

Cape Lookout, but each time the *Isbjorn* was driven back by the current.

Towards the middle of August the ice to the east of Hope Island had cleared away, and on the 22nd August 76° 45′ was reached, but contrary winds prevented a higher latitude being attained. The course was again set eastwards along the margin of the ice, and on the 31st of August the latitude was 78° 30′.

They had now arrived at the conclusion that the Novaya Zemlya Sea was not filled with impenetrable ice, as was generally supposed, but that it was probably open every year up to 78°, and that the most favourable time for navigation was towards the end of August.

The *Isbjorn* returned to Tromsoe on 4th October.

It was now considered desirable that a well-equipped expedition should be dispatched to the Novaya Zemlya seas, either to penetrate towards the north, or to attempt the North-East Passage — hence the Austro-Hungarian Expedition.

The *Tegetthoff*, a vessel of 220 tons burden, was fitted out for two and a half years. The engine was of 100 horse-power, and the ship carried 130 tons of coal. The officers and crew numbered twenty-four. Some spoke German, some Italian, and others either Slavonic or Hungarian. The command was twofold: Weyprecht had charge of the ship, and Payer had command of the sledge-expeditions.

The *Tegetthoff* left Bremerhaven on the 13th of June 1872, and Tromsoe was reached on the 3rd of July. Here they remained a week while the ship was overhauled and repaired and the supply of coal replenished. Captain Olaf Carlsen joined the ship as icemaster and harpooner. He had deservedly gained fame through having circumnavigated Spitzbergen and Novaya Zemlya. Tromsoe was left on 13th July.

Ice was first seen on 25th July in latitude 74°. On the 29th they were able to continue their course only under steam, and the vessel encountered heavy shocks in charging the ice. Next day they were beset, and did not escape from the ice until 3rd August, when they broke through into the open coast-water of Novaya Zemlya. A belt of ice 105 miles broad lay behind them, and they steered due north in view of the mountainous coasts.

Great was their astonishment and joy when on 12th August they met the *Isbjorn* and found on board Count Wilczek, who had given a large donation towards the expense of the expedition, and who was about to establish a dépôt of provisions at Cape Nassau. The two ships now proceeded north in company to the Barentz Isles, where a dépôt of provisions was established. Here they parted from the *Isbjorn*, and steamed towards the north on the 20th August. Within a few hours the *Tegetthoff* became beset, and was destined never to be again released. The position was now 76° 22′ N. latitude, 63° 3′ E. longitude. Well might Payer write: "Happy is it for men, that inextinguishable hope enables them to endure all the vicissitudes of fate, which are to test their powers of endurance, and that they can never see, as at a glance, the long series of disappointments in store for them!"

From day to day they hoped they would be able to escape from the ice; then they hoped from week to week, then from season to season, and lastly in the chances of new years!

The ship drifted slowly towards the north, and had passed the 77° on 2nd October. On the 6th October the first bear was killed and was divided among the dogs. They had on board eight dogs, six of which had been brought from Vienna, and the other two from Lapland.

On the 12th October only a line of heights some

30 miles away to the south could be seen, and soon afterwards every trace of land disappeared. As winter approached, the ice pressures began, and during the next few months the crew were kept in a state of terror. Preparations were made to abandon the ship if necessary, and for long periods the crew did not undress. Nightly they rushed on deck, more than once believing that at last the ship was doomed. Floes were crushed and piled around the ship high above the level of the deck, and noise and confusion reigned supreme. They lived as if they constantly expected an earthquake. This condition of affairs continued in greater or lesser measure for 130 days. Some of the crew must have been very superstitious, as indicated by the fact that the antlers of a reindeer which were on board were suspected of having something to do with the ice pressure, and were thrown overboard. This not having the desired effect, the skull of a bear was treated likewise. It may be mentioned here that during this expedition no fewer than sixty-seven polar bears were killed.

The *Tegetthoff* still slowly drifted to the north, and on the 19th February 1873 had reached latitude 78° 15′. Payer formed the opinion that wind was the main cause of the drifting, and that sea-currents were only of secondary importance. De Long and Nansen in later years were to prove that Payer's opinion was true.

Life on board the *Tegetthoff* was extremely monotonous, especially during the darkness of winter. With the arrival of summer in 1873, they had great hope of deliverance from the ice, but this hope was not realised.

The second summer was drawing to a close when the most remarkable event of the voyage occurred. It was on the 30th August, in latitude 79° 43′ and longitude 59° 33′ E., that the startling discovery was made that land could be seen in the distance. This discovery, totally unexpected,

infused new life into the whole expedition. The new land received its name from that of the Austrian Emperor, and was christened Kaiser Franz-Josef's Land. By the end of September the *Tegetthoff* had drifted to 79° 58', which was the highest latitude it attained. An attempt was now made to reach the land, but a fog compelled the party to return to the ship.

At the beginning of November the ship had drifted to a point not far from land, and a second attempt to reach it proved successful. The sun, however, had now disappeared, and the twilight did not enable them to make any extended exploration. There was also a danger of the ship drifting away.

The second winter passed much more pleasantly than the first. The ice pressures were not very severe, and the crew had become much more accustomed to them. The exploration of the new land which was to take place in the spring of 1874 gave food for much speculation, and tended to relieve the monotony.

In February 1874, Payer, as commander of the expedition on shore, held a council to whom he explained his plan for the projected sledge-journeys. As there was a possibility of the ship drifting away from the land, it was decided that provisions for three months should be deposited on land, and that in the event of the sledge-party being cut off from the ship they should attempt to reach Europe. The sledge-expeditions were to begin in March and be continued for six or seven weeks. It was also agreed that after the termination of the sledge-expeditions the *Tegetthoff* should be abandoned, and that the whole expedition should attempt to reach Europe in their boats.

The greatest activity now reigned in the ship, in order to be prepared for the sledge-journey. Some of the crew had suffered from scurvy, but with the exception of the

engineer, who was suffering from consumption, there was no dangerous case of sickness.

The sledges used had runners 6, 8, and 11 feet long, and $1\frac{1}{2}$, 2, and $2\frac{3}{4}$ inches broad, respectively, and were gently curved at each end. The height of the sledges above the snow was about 1 foot, and they were constructed of the best ash. They carried loads amounting to 7, 12, and 20 cwt. The two runners were fastened together by two strong front boards, and by four cross-pieces of wood firmly lashed to the upright standards of the sledge, which were themselves dovetailed into the runners.

As regards the cooking apparatus, Payer points out that it should be made of sheet iron, each of its parts of one piece, and there should be no soldering, in order to diminish the risk of breakage and the setting fire to the tent by the escape of the spirit in a state of combustion.

The covering for the feet consisted of sailcloth boots, lined with flannel, and soled with stout felt. They were made wide so that they could be put easily over three pairs of strong woollen stockings.

The first sledge-party left the ship on 11th March 1874. It was equipped for one week, and its object was to reconnoitre a route for an extended journey towards the north. Payer took six men and three dogs. In about two hours after leaving the ship they had passed the south-west cape of Wilczek Island, on which they had previously landed. During this journey Payer began the determination of the localities of Franz-Josef Land, by a triangulation of elevated points, to which the measurement of a base was afterwards to be added. The ascent of high mountains therefore formed part of the programme.

Hall Island at Cape Tegetthoff was reached on the 12th March. Part of the journey had to be made against driving snow with a temperature about 26° F. below zero. In the afternoon of the 12th, Payer with two Tyrolese

ascended the plateau of Cape Tegetthoff. Those who remained behind spent their time in rubbing their feet with snow. The summit was reached in two hours, and the height was ascertained to be 2600 feet. The weather conditions were not favourable, and the view in consequence was limited. Next morning they entered Nordenskjöld Fiord, and at noon reached the high, precipitous termination of Sonklar Glacier. In the afternoon, Payer with the Tyrolese ascended Cape Littrow, 2500 feet in height, and early on the morning of the 14th they ascended to the summit of the precipitous face of the Sonklar Glacier. Here the temperature went down to the lowest ever experienced by Payer, about -59° F. below zero. They had taken some rum with them, and as each took his share, he knelt down and allowed another to shake it into his mouth, without bringing the metal cup in contact with the lips. The rum seemed to have lost all its strength and fluidity. It tasted like milk, and its consistence was that of oil. The bread was frozen so hard that they feared to break their teeth in biting it, and it brought blood as they ate it. They attempted to smoke cigars, but the icicles on their beards always put them out. The instruments used in surveying seemed to burn when they were touched. Payer found that this extreme cold was depressing in its influence, and enfeebled the powers of the will. At first, cold stimulates to action, but when extreme, this vigour is quickly followed by torpidity; exertion is soon followed by the desire to rest. Persons exposed to these extremely low temperatures feel as if they were intoxicated: from the stiffness and trembling of their jaws they speak with great effort. When dragging a sledge, their breath streams forth like smoke, which is soon transformed into a mass of needles of ice, almost hiding their mouths from view. Ice becomes so hard that it emits a ringing sound; wood is as difficult

to cut as bone; butter becomes like stone; meat must be split, and mercury may be fired as a bullet from a gun. Snow of a temperature of 30° below zero feels in the mouth like hot iron, and does not quench but increases thirst by its inflammatory action on the mucous membrane.

After descending from the Sonklar Glacier, they decided to return to the ship, which was reached on the 15th March. Two of the party had frost-bitten feet, one had his face frost-bitten, and a fourth had both his hands severely affected. Next day, Krisch, the engineer, died from consumption. He was buried on Wilczek Island.

The second sledge-journey began on the 26th March. Payer again took six men and three dogs. The provisions consisted of boiled beef, bread, pemmican, bacon, extract of meat, condensed milk, coffee, chocolate, rice, grits, salt, pepper, peas-sausage, and sugar. The total weight carried, including two sledges, amounted to about 14 cwt.

They had not gone more than 1000 yards from the ship when driving snow compelled them to pass twenty-four hours in the tent. A start was again made on the 27th March, but when near Wilczek Island they had to halt for an hour in order to rub the frost-bitten hands of one of the men. On the 29th, Payer ascended the rocky heights of Koldewey Island. On the shore of this island the winter retreat of a family of bears was discovered. It was a cavity hollowed out in a mass of snow lying under a rocky wall. As they proceeded north they went round Schönau Island, named after Payer's birthplace. Here a dépôt of provisions was placed in a cleft of the rocks and covered with 4 feet of snow.

When nearing Cape Frankfurt, which is a promontory of Hall Island, they could not make out whether the opening between this and the Wullersdorf Mountains would be the proper route to the north. In order to settle this question, Payer and Haller left the sledge and

made a forced march to Cape Frankfurt, which they ascended, and from a height of 2000 feet were able to ascertain the route. From here the coasts of Wilczek Land appeared to run in a northerly direction, and then to trend gradually to the north-east. A broad inlet, to which the name "Austria Sound" was given, was seen to run far towards the north. A great many icebergs were met here, indicating the presence of large glaciers. On the day that they entered this sound, a bear was killed, from which they took 50 lb. of flesh for their own use, and gave the rest of the carcass to the dogs. At the same time they deposited 50 lb. of boiled beef on an iceberg close by.

On the 4th April they passed Cape Tyrol in driving snow, and on this day one of the dogs was lost. A gull flew past and the dog burst away from the sledge, and in hot pursuit of the bird disappeared from sight, and was never seen again. On the 5th April the 81st degree was reached. Before setting out on this journey, Payer guaranteed to give the men 1000 florins if the 81st degree was reached, and 2500 florins if they reached the 82nd degree. Two bears were killed on this day, and their flesh formed the principal food. It was not, however, much appreciated. Payer describes it as tolerable food for sea-gulls, but hardly fit even for devils on the fast-days of the infernal regions.

When approaching Becker Island the atmospheric conditions were such that it could not be seen until it was only about 100 yards away. Instead of rounding this island, it was decided to cross it. When the highest point was reached, Austria Sound was seen to still stretch towards the north, but the sea presented the appearance of a chaos of icehills and icebergs.

On the 7th April, in latitude 81° 23′, could be seen the faint outlines of mountains in Crown-Prince Rudolf's

Land. Here Payer writes: "At this latitude it seemed as if Wilczek Land suddenly terminated, but when the sun scattered the driving mist we saw the glittering ranges of its enormous glaciers—the Dove Glaciers—shining down on us. Towards the north-east we could trace land trending to a cape lying in the grey distance —Cape Buda Pesth, as it was afterwards called." This passage was destined to form a great puzzle to Nansen in later years. It is evident, however, that the atmospheric conditions were not favourable for accurate observations, and on his map Payer shows that this part of the coast-line was considered doubtful.

As it appeared to Payer that Crown-Prince Rudolf's Land and Karl Alexander's Land formed a continuous whole, and therefore barred the way to the north, he diverged into Rawlinson Sound. The track lay between countless hummocks, some of which Payer estimated to be 40 feet high. The advance now became one continual zigzag. On the 9th April an iceberg was ascended from which it was seen that the hummocks in Rawlinson Sound appeared to stretch on without end. The course was therefore altered to a north-westerly direction in order to come under Crown-Prince Rudolf's Land, but the character of the ice still remained unchanged, and Payer was compelled to make for Hohenlohe Island in the west, where he decided to divide the expedition into two parties.

Payer determined that he, with Orel, Zaninovich, and Klotz, should push on with the dog-sledge, and that the other three men should remain behind at Cape Schrötter. Payer explained the plan he meant to follow, and stated that he should be absent from five to eight days, but that if he should not return within fifteen days they were to march back to the ship with the sledge. A pocket-compass, a watch, an aneroid barometer, and a

thermometer were left with the remaining party. The tent was divided in two, each party receiving a half. The advance party took provisions for eight days, and the two remaining dogs had to drag the sledge with a weight of about 4 cwt.

As they approached the promontory on the south of Crown-Prince Rudolf's Land, numerous icebergs were met, which according to Payer were from 100 to 200 feet high. The Middendorf Glacier was now reached, and an attempt was made to cross it. Towards its lower part many crevasses were bridged over with snow. Farther on, the glacier appeared smooth and free from crevasses, and it was anticipated that it could be crossed without difficulty. Here, Klotz confessed to Payer that one of his feet was swollen and ulcerated. Payer decided at once that it would be necessary to send Klotz back to the other party at Hohenlohe Island. Laden with a sack and carrying a revolver, he set off, and soon disappeared.

Meanwhile Payer and the other two men had again packed the sledge and harnessed the dogs, and were setting out, when, without the slightest warning, the snow gave way beneath the sledge, and Zaninovich, the dogs, and the sledge disappeared in a crevasse. Payer, who was attached to the rope, was dragged backwards to the edge of the crevasse, and expected to be precipitated into it, but at this moment the sledge stuck fast between the sides of the crevasse. Orel now advanced to the edge and stated that he could see Zaninovich lying on a ledge of snow in the crevasse, with precipices all round him, and the dogs attached to the traces of the sledge. Payer, who was lying on his stomach near the edge of the crevasse, had still one of the traces fastened round his waist. This he decided to cut, although Zaninovich cried up that he was afraid that the sledge would then fall on him. When the trace was cut, the sledge made

a short run and then stuck fast again. Payer now jumped the crevasse and shouted to Zaninovich that he would require to run back to Hohenlohe Island to fetch men and ropes for his rescue; that if he could contrive for four hours to keep himself from freezing, all would yet be well. Payer at once started to run down the glacier back to Cape Schrötter, 6 miles off. Bathed in perspiration, he threw off his bird-skin garments, his boots, and his shawl, and ran in his stockings through the deep snow. On the way he passed Klotz, who at first feared that Payer had lost his senses. On reaching Cape Schrötter a rope was detached from the large sledge, and the whole party, with the exception of Klotz, set off for the glacier. Reaching the glacier, they tied themselves together, Payer leading. On arrival at the crevasse, Payer shouted, but at first could hear no reply. At last he heard the whining of a dog, and then an unintelligible answer from Zaninovich. Haller, who was immediately let down by a rope, found Zaninovich still living, but almost frozen, on a ledge of snow 40 feet down the crevasse. He fastened himself and Zaninovich to the rope, and they were drawn up after great exertion. Haller again descended, and fastened the dogs to the rope. They had managed to free themselves from their traces and had sprung to a ledge near where Zaninovich had lain. After they were drawn up, they gave expression to their joy, first by rolling themselves vigorously in the snow, and then by licking the hands of the party. Haller was next raised to the level of the sledge, so that he might cut the ropes which fastened the loading. The articles were brought up one by one. Nothing of any importance had been lost. The party now descended the glacier, and the three men from Cape Schrötter returned there, while Payer and his companions camped at Cape Habermann.

A route along the west coast of Crown-Prince Rudolf's

Land was now followed. When Cape Brorok was reached, the latitude was found to be 81° 45′. Payer here writes: "To the north-west we saw at first nothing but ice up to the horizon; even with the telescope of the theodolite I could not decide for the existence of land, which Orel's sharp eye discovered in the far distance." Payer also remarks that, in the Arctic regions, it often happens that banks of fog on the horizon assume the character of distant ranges, for the small height to which these banks rise in the cold air causes them to be very sharply defined. It is also very common, he says, to make the same mistake in the case of mists arising from the waste water of enormous glaciers.

When Cape Auk was reached, a dark water-sky appeared in the north, and great numbers of birds were seen. Seals lay on the ice, and traces of bears and foxes were numerous. Had Payer been inclined to believe, like Hayes, in the existence of an open Polar Sea, these signs of a richer animal-life would have gone far to support the belief. Payer, however, called this belief an "antiquated hypothesis."

The ice was now so thin that they thought it expedient to tie themselves together with a long rope. Ascending an iceberg in Teplitz Bay, the open sea was seen stretching far to the west; and at Cape Säulen the open water reached the coast. Here Payer ascended a height to reconnoitre the track for next day. Land was no longer visible towards the north. The 12th April was the last day of advance in a northerly direction. The march lay over snowy slopes to the summits of the coast-range, from 1000 to 3000 feet high. At noon the latitude was taken at Cape Germania, and found to be 81° 57′. They reached Cape Fligely in five hours, and here decided to turn back. Payer estimated the latitude of this point to be 82° 5′. Rudolf's Land still stretched in a north-

easterly direction towards a cape named after Sherard Osborne. From Cape Fligely it could be seen that the open water was simply a "Polynia" surrounded by old ice. Blue mountain-ranges were believed to be visible in the distant north, and were named "King Oscar Land" and "Petermann Land."

After enclosing a brief account of the journey in a bottle and depositing it in a cleft of rock, the return journey was begun. Cape Schrötter was reached on the evening of the 13th April. It was well for those left there that nothing serious happened to Payer's party, for although all the means of ascertaining their position had been given to them, when asked what direction they would have taken to return to the ship, they pointed north-east up Rawlinson Sound!

Cape Schrötter was left on the 14th April, and the party made for the Coburg Islands, in very bad weather. Klotz's foot had become much worse, and all those who had been left behind were more or less snow-blind. It struck Payer as peculiar that the dogs did not suffer from this affection, close as they were to the glare of the snow and without any protection against it. Coburg Islands were reached in the evening. Next day, after a severe march, they got clear of the region of ice-hummocks, and were able to use their sledge-sail. On the return journey Payer ascended Cape Hellwald, 2200 feet, and Cape Tyrol, 3000 feet, above sea-level.

On the 19th April, south of Cape Tyrol, they came on open water, and had to take to the coast of Wilczek Land. The iceberg on which one of the dépôts had been placed was afloat, and could not be reached. Their provisions were now running short, and they were still 55 miles from the ship. During the next two days they struggled on in terrible weather. Their last dépôt, fortunately, was discovered, and also the remains of a bear

killed on the way north. The open water was now found to have retreated to the west, and this enabled them to reach Cape Frankfurt, on Hall Island. From here the ice could be seen stretching away to the south. When Cape Orgel was reached, it was with anxious feelings that Payer began its ascent. It was from here he would be able to ascertain whether the *Tegetthoff* had been drifted away from its former position. He was overjoyed to find the ship about 3 miles off. The whole party reached it on 23rd April.

The weather towards the end of April was good, and favoured the carrying out of the third and last sledge-expedition. Payer was anxious to ascertain, if possible, how far Franz-Josef Land extended towards Spitzbergen. On the 29th April he again left the ship, with Haller, Lieutenant Brosch, and the two dogs. Provisions for a week were carried. Cape Brünn, on McClintock Island, was to be their objective. This was ascended on the 2nd May, and was found to be 2500 feet high, but the boundaries of the land towards Spitzbergen could not be determined. On the night of the 2nd May they began a forced march of twenty-two hours back to the ship. The total distance of the sledge-journeys was estimated to be about 450 miles.

Preparations were now made to abandon the *Tegetthoff*, and to make an attempt to reach Europe. Three boats were selected for the return: two of these were Norwegian whale-boats, 20 feet long. Each of the boats was placed on a sledge, and the weight to be dragged, including everything, amounted to the formidable total of 90 cwt.

The plan was to reach the dépôt of provisions on the Barentz Islands, which lay almost directly south. After replenishing stores there, they proposed to follow the coast of Novaya Zemlya with the hope of reaching one

of those ships which go there for the salmon fishery. They also had the hope that they might come across a Norwegian seal-hunter farther north.

The *Tegetthoff* was left on 20th May 1874. The first day's advance amounted to 1 mile. They had to pass three times heavily laden, and twice empty, over every bit of the road. The snow was deep, and more than half of the expedition was required to move a boat. During the first week Payer and two men returned daily to the ship with the dog-sledge in order to replenish the store the party had consumed. A bear was shot on the 23rd, another on the 26th, and a third on the 31st May. At the end of May, when only 5 miles from the ship, they approached a water-space, but found the margins so surrounded with broad barriers of broken ice that the boats could not be launched. They therefore decided to camp, and wait for more favourable conditions. It was not until the 17th June that the ice opened near to them, and the boats were launched on the 18th. They had not proceeded more than 3 miles when they were stopped by ice, and the boats had to be drawn on to it. Next morning there was no water to be seen. On the 20th they crossed a "lead," and then were detained in the same position two days. During the rest of June they had continually to cross "leads" and water-holes. At noon on the 1st July they had only reached 79° 38′. On the 4th the latitude was found to be 79° 43′, so that they had drifted north. From the 9th to the 15th July they rested and waited for the ice to open. On the 20th July the latitude was 79° 11′, so that during two calendar months they had advanced only 47 geographical miles. The water-spaces now became larger, and more satisfactory progress was made.

On the 7th August they believed they had reached the open sea, as they observed the ice alternately rising and

falling. Next day they were again shut in the ice, and there was now no appearance of open water. From the 10th to the 13th they waited on the ice opening, and employed part of the time in caulking their boats. On the 13th the latitude was 77° 58′, so that they were now exactly 2 degrees south of the starting-point. On the 15th August the open water was at last reached, in 77° 40′.

The sledges were now left behind, but although the boats were much crowded, the two remaining dogs were at first taken on board. Later, however, it was found that they would put the crew to great inconvenience, and with reluctance they had to be killed. The course was now shaped towards the Barentz Islands. On the 16th, the snowy summits near Cape Nassau were sighted. Next day a fog came on, and before it cleared they found they were far beyond the Barentz Islands. Instead of returning to the dépôt, they preferred to take the risk and push on.

On the 18th August they first landed on Novaya Zemlya, where they found coltsfoot (*Tussclago farfara*), the leaves of which were dried and used as tobacco. They were greatly disappointed in not finding a vessel in Matoschkin Bay. On the 23rd August, only ten days' provisions remained. In the evening on the 24th they passed Cape Britwin, and suddenly they beheld a small boat with two men in it. There was a great cry of joy from the Austrian boats, and as the two men pulled towards them, and before either party could explain, a corner of rock was turned, and now in full view lay two ships. These were two Russian vessels from Archangel, and were engaged in the salmon fishery. The Austrians were received by the Russians with the greatest friendliness. It was the intention of the latter to remain where they were for fourteen days longer, and to spend about

the same number in fishing and hunting at the southern extremity of Novaya Zemlya. This programme did not suit the Austrians. It was therefore arranged that one of the vessels should take the expedition to Vardo, in Norway, without delay, and that in return for this service the Russians should receive three of the Austrian boats, two rifles, and be guaranteed a sum of 1200 silver roubles.

The *Nikolai* sailed on the 26th August, and reached Vardo on 3rd September. Two days later the mail steamer from Vardo to Hamburg took the expedition on board, and stopping at Tromsoe, put ashore Captain Carlsen.

The discovery of Franz-Josef Land was an important one, and stimulated further Arctic exploration. It also served as a new point from which to attack the Pole.

CHAPTER VII

THE BRITISH EXPEDITION OF 1875–76

The Government of Queen Victoria having determined that an expedition of Arctic exploration should be undertaken, the ships *Alert* and *Discovery* were specially fitted out for this service, and the command given to Captain George S. Nares. The ship *Valorous* was also to accompany the expedition to Disco with stores and then return. The primary object was to attain the highest northern latitude, and, if possible, to reach the North Pole. The expedition was fitted out regardless of expense. According to the Admiralty instructions, the second ship was not to be carried northward of the 82nd parallel, so that the crew of the advance ship might fall back on it in case of emergency.

The two ships left Portsmouth on 29th May 1875, and arrived at the island of Disco without special incident. Here the services of Frederick the Eskimo were obtained, and at Proven, Hans Hendrick was also engaged. This was the same Hans who had previously accompanied three American expeditions.

A dépôt of 3600 rations was landed on the most south-eastern of the Carey Islands, and also a boat. On the 27th July the two ships passed between Northumberland and Hakluyt Islands.

On the south-west brow of Littleton Island a cairn was erected, in which was placed a notice containing a

short account of the movements and prospects of the expedition up to that time.

Nares formed the opinion that "Hartstene Bay is the best winter-station on the North Greenland coast; its shores are washed by a warm current coming from the southward, whilst the projecting promontories of Cape Hatherton and Cape Ohlsen deflect the Polar current to the other side of the Sound. Owing to the narrowing of the channel at the entrance of Smith Sound the velocity of the tidal currents is greatly augmented, and even in winter large water-spaces are kept open. The moisture and warmth imparted to the atmosphere by the uncovered water moderates the climate in its vicinity to some extent, and consequently we find in the neighbourhood of Hartstene Bay a land comparatively well vegetated and a great abundance of animal-life. As Port Foulke can be visited yearly from the southward in all but very exceptional seasons, it can be recommended as an important base if further explorations by Smith Sound are hereafter undertaken."

On 29th July the two ships crossed Smith Sound, steering direct for Cape Isabella. The snow-clad coast of Ellesmere Land was very clearly defined, the black headlands, separated by glacier-filled valleys, standing out prominently from the white background.

A cairn was erected on the outer spur of Cape Isabella, 700 feet above the water-line; a cask for letters and a few cases of preserved meat being hidden away on a lower point, about 300 feet high, magnetic west of the cairn.

Proceeding northward, shelter had to be taken in a harbour, named after Payer, beside Brevoort Island. Nares mentions this as a most convenient waiting-place for vessels attempting to proceed northward by Smith Sound. A dépôt of 240 rations was placed on the peninsula that forms the southern protection of the

harbour. A cairn was built on the summit of Brevoort Island, in which a record paper was subsequently placed. These provisions were not afterwards touched.

The second large dépôt of 3000 rations, for use in the event of a compulsory retreat, was landed at a small protected bay 2 miles north of Cape Hawks.

Cape Frazer, where the Polar and Baffin's Bay tides meet, was passed on the 19th of August. During the previous three weeks they had advanced 90 miles, or about $4\frac{1}{4}$ miles a day.

At Cape Collinson a dépôt of 240 rations was landed about 100 yards inshore and 30 feet above the waterline. These provisions were not afterwards disturbed by the expedition.

On reaching Kennedy Channel it was decided to make for open water, which was seen in the middle of the strait. This was reached after some difficulty, and the ships were soon advancing up the channel, which was comparatively free of ice, and was therefore in much the same condition as when seen by Morton. They steered for Cape Morton, at the north-east extremity of Kennedy Channel. Here a dépôt of 240 rations was landed for the use of travelling parties which were to be afterwards dispatched for the purpose of exploring Petermann Fiord.

Hall Basin being filled with ice, the two ships crossed to the western coast, and entered Lady Franklin Sound, where the *Discovery* was left in a bay named "Discovery Bay." This point was reached on the 25th of August.

The *Alert* had to wait until the 28th before an opportunity offered to proceed northwards. A dépôt of 1000 rations was placed on a hillside 30 feet above the sea, on the northern shore of Lincoln Bay. A cairn, which could be seen from the ice a mile from land, was built a few yards inshore of where these provisions were deposited. They were not afterwards disturbed.

Floeberg Beach was reached on the 1st of September, and here the *Alert* was fated to remain eleven months. The ice was occasionally driven offshore by gales, but after September 16th the ice never left the shore to the westward of the *Alert*, although to the eastward a large space of clear water remained between the *Alert* and Robeson Channel whenever the wind prevailed from the westward.

On the 18th of September the thermometer rose to 36° F.; on the 19th it had fallen to 15° F. The first star was seen on the night of the 20th September.

With the object of exploring the land about Cape Joseph Henry, Lieutenant Aldrich, with Frederick and two seamen, Ayles and Simmons, started on the 22nd, with fourteen dogs dragging two sledges laden with fourteen days' provisions. The dogs were allowanced at the rate of 2 lb. of preserved meat daily.

On the 26th a large party started with the object of establishing a dépôt of provisions as far in advance to the north-west as possible. This party consisted of two seven-man sledges and one eleven-man sledge; they were provisioned for twenty days. The sledges were weighted to 200 lb. a man. The eleven-man sledge proved too heavy for the young ice, and another seven-man sledge had to be taken instead. The temperature during the first night fell to 1 degree below zero.

On the 5th of October, Lieutenant Aldrich returned with eleven dogs harnessed to one sledge on which his light gear was secured. Everything else had been left a few miles behind to enable him to reach the ship that night. The dogs, sinking as they frequently did in the soft snow up to their muzzles, had proved to be nearly useless, and but for the help of the men the sledge would have had to be abandoned. Aldrich had succeeded in reaching Cape Joseph Henry, and had spent three days in

exploring the neighbourhood. The floebergs and rugged ice piled directly against the precipitous face of the cliffs, with an extremely rough pack in constant motion, effectually prevented sledges being dragged round the cape; but fortunately there was a fair prospect of finding a level road overland to the sea on the other side of the cape in the spring. On the 27th September, Aldrich had succeeded in reaching latitude 82° 48′ N., a higher latitude than had ever before been attained, Parry's 82° 45′ reached in 1827 having now been beaten.

As regards the use of dogs, Aldrich on this journey formed the opinion that when the snow becomes more than a foot deep, they are not of much value.

The large sledge-party which succeeded in establishing a dépôt of provisions at Cape Joseph Henry returned on September 14th. Out of the party of twenty-one men and three officers, seven men and one officer returned to the ship badly frost-bitten, three of them so severely as to render amputation necessary, the patients being confined to their beds for the greater part of the winter. The frost-bites were attributable entirely to the wet sludgy state of some of the ice that had to be crossed. The temperature ranged between 15° above and 22° below zero. On this journey attention was drawn to the fact that the barrels of the breech-loading fowling-pieces became contracted by the cold to such an extent that the paper cartridges which at a higher temperature fitted well could not be inserted until the outside paper had been stripped off.

The sun disappeared on the 11th October, but for some time afterwards there was twilight during five or six hours of the day. The first sign of an aurora was seen on the 26th October; on the 27th stars were visible at noon. On the 8th November, with a perfectly clear sky, the noon twilight was insufficient to enable one to make out

the words in a *Times* leading article, when the paper was held up facing the south. On the 9th November, Nares writes :—

"To-day the moon reappeared above the southern horizon. Her movements are so important to us that a monthly bulletin is published giving the precise account of when she will appear and when depart. She is truly the 'presiding goddess' of the long Arctic night; reflecting to us, during each of her visits, the light of the totally absent sun for ten successive days and nights as she circles round the heavens without ever setting. During some period of her stay full moon occurs, and she displays her greatest beauty. At the time of new moon, when her light would be of the least value, she is absent in southern latitudes. Thanks to her we can never realise what existence would be if totally deprived of light."

On the 23rd of November mercury became frozen for the first time, at $-45°$ F. The mean temperature of February was $-38°$ F. The mean for the 3rd and 4th March was $-69{\cdot}6°$. On the 3rd March two reliable thermometers registered below $-73°$ F., or $105°$ below the freezing-point of fresh water.

Nothing of special importance occurred during the winter. Christmas was spent cheerfully; a school was started, and a course of lectures and entertainments was given every Thursday evening. There was little but the weather to chronicle.

On the 12th of March, Mr. Egerton and Lieutenant Rawson, accompanied by Petersen and nine dogs, started for the *Discovery*, the sledge being weighted to 51 lb. per dog. This party had to return on the 15th owing to the illness of Petersen. "He was taken ill on the 2nd March with cramp, and afterwards, being unable to retain any food whatever, nothing could keep him warm, and he

became badly frost-bitten. By depriving themselves of their own warm clothing and at great personal risk, the two officers, his only companions, succeeded in restoring circulation. The following day, Petersen being no better, they wisely determined to return with him to the ship. But the gale of the 14th rendering it impossible to travel, and the tent being very cold, they burrowed out a hole in a snow-bank, and with the aid of a spirit-lamp raised the temperature inside to 7°. With a noble disregard of themselves, they succeeded in retaining some slight heat in the man's body by alternately lying one at a time alongside of him while the other was recovering his warmth by exercise. On the morning of the 15th, the patient being slightly better, and the weather permitting, they started to return to the ship with the sledge lightened to the utmost.

"During the journey of 16 miles over a very rough ground, although frequently very seriously frost-bitten themselves, they succeeded in keeping life in the invalid until they arrived on board. He was badly frost-bitten in the face and feet.

"Notwithstanding the professional ability and incessant care of Dr. Colan, Petersen never recovered from the severe shock which he had received, and eventually expired from exhaustion three months afterwards."

On the 20th March, Mr. Egerton, with Lieutenant Rawson, accompanied by John Simmons and Michael Regan, one of the crew of the *Discovery*, started with a sledge drawn by seven dogs for Discovery Bay, the dogs dragging 78 lb. each.

They returned on the 4th April. They arrived at Discovery Bay on the 25th of March, and left again on the 30th. The temperature was very low during this journey, and great difficulties as regards snow and ice had to be overcome.

The great sledge-party to the west and north left the

ship on the 3rd of April. It consisted of fifty-three officers and men. Each man in the northern division dragged 230 lb., and those of the western division 242 lb.

"The programme was as follows: Lieutenant Aldrich, assisted by a sledge-crew under the command of Lieutenant Giffard, was to explore the shores of Grant Land towards the north and west, along the coast-line he had discovered the previous autumn. Commander Markham, seconded by Lieutenant Parr, with two boats, and equipped for an absence of seventy days, was to force his way to the northward over the ice, starting off from the land near Cape Joseph Henry; three sledge-crews, under the commands of Dr. Moss and Mr. George White, accompanying them as far as their provisions would allow."

On the 20th April, Lieutenants Beaumont and Rawson, and Dr. Coppinger, with twenty-one men dragging four sledges weighted to 218 lb. a man, started for the north coast of Greenland.

On the 25th of May, Captain Nares decided to go to Cape Joseph Henry to obtain a view of the northern ice from the lofty mountains in the locality. He arrived there on the 29th, and ascended Mount Julia, the highest peak near the sea, which rises to an elevation of not less than 2000 feet. The atmosphere being very clear, an extensive view was obtained. The hills of Greenland, 120 miles distant, were plainly seen in the neighbourhood of Cape Britannia. He was satisfied that no land exists to the north within 50 miles of Cape Joseph Henry, and no high land within 80 miles. In his narrative of this journey he writes:—

"Whether or not land exists within the 360 miles which stretch from the limit of our view to the northern axis of the globe is, so far as sledge-travelling is concerned, immaterial. Sixty miles of such pack as we now know to extend north of Cape Joseph Henry is an in-

superable obstacle to travelling in that direction with our present appliances; and I unhesitatingly affirm that it is impracticable to reach the North Pole by the Smith Sound route."

Let us now follow the northern sledge-party which left the *Alert* on 3rd April 1876. The dépôt of provisions at Cape Joseph Henry was reached on 10th April, and the remainder of that day was employed in bringing the provisions off to the sledges, which were left on the ice. Up to this point the northern and western parties had travelled together. Next day they separated, and the two supporting sledges returned to the ship.

The ice over which the northern party had to travel was of an extremely rugged character. Roads had frequently to be made before the sledges could be dragged forwards. To make matters worse, the snow in many places had drifted to such a depth that the men were frequently floundering in it up to their waists. Little mention is made of snow-shoes throughout the expedition, and here undoubtedly they would have been of great service. At first they attempted to console themselves with the idea that the irregular and broken sea of ice was only caused by the proximity to the land, and that they should afterwards meet with smooth level floes, on which they should advance rapidly. The belts of hummocks that separated the floes varied from 20 yards to half a mile in breadth, and were from 15 to 50 feet in height. In order to keep the sun as much as possible at their backs, they travelled between noon and midnight. During the first week the temperature was usually about 30° below zero, and little sleep could be obtained. On the 14th one of the crew complained of pains in his ankles and knees. Although ignorant of the fact, this was the first appearance of the dreaded scurvy. During the 15th and 16th they were confined to tent by a gale, with

a temperature of 67° below freezing-point. On the 17th another of the crew was found suffering from swollen and puffy knee-joints.

On the 19th, Markham decided to abandon the larger boat. This boat had always been regarded as an incubus by the party, and every one was well pleased to get rid of it. Even then, in order to advance the three sledges, the road had to be frequently walked over five times. On this day, the 19th, a third man fell ill. On the 24th the 83rd parallel of latitude was crossed. Other two of the party exhibited symptoms of scurvy on the 27th. The temperature on the 28th rose to 2°, the first day the thermometer registered above zero. On the 2nd of May Markham became convinced that his invalids were suffering from scurvy. Great as were the natural difficulties which surrounded him, this was rightly regarded as the most formidable of all obstacles to their advance that could possibly be imagined. On the 7th May three of the invalids had to be carried on the sledge, and the other two could scarcely walk. On the 10th, Markham arrived at the determination of dragging the sledges no farther in a northerly direction. He decided to give the invalids two days' rest. In order to insure being within 400 miles of the North Pole, the whole of the party, with the exception of the invalids and two men to look after them, started on the 12th to the northward, carrying with them the sextant, artificial horizon, and all their colours and banners. Shortly before noon, the artificial horizon was set up, and the flags and sledge-standards displayed. The latitude was found to be 83° 20′ 26″ N., or 399½ miles from the North Pole. The announcement of the position was received with three cheers, with one more for Captain Nares; then all sang the "Union Jack of Old England," winding up, like loyal subjects, with "God Save the Queen."

The return journey was then commenced. Day by day their strength diminished. Gradually, but surely, the men, one after the other, began to feel the cruel grasp of the scurvy, as they struggled manfully on, dragging their helpless companions. Towards the end of May, although the temperature of the outside air was below the freezing-point, the sun was so powerful that it would raise the temperature inside the tent to as much as 70° or 80°. Snow fell heavily during the greater part of the return journey, and fogs were very prevalent. On the 19th of May ominous symptoms of a disruption of the pack were seen. A crack in some ice had opened considerably. On the 25th the 83rd parallel of latitude was recrossed.

The condition of the party was so critical on the 27th that it became only too painfully evident that, to insure their reaching the land alive, the sledge must be considerably lightened in order to admit of a more rapid advance. The state of the party was on that day as follows: five men were in a very precarious condition, utterly unable to move, and consequently had to be carried on the sledges; five others nearly as bad, but who nobly persisted in hobbling after the sledges, which they could just manage to accomplish, for, as the sledges had to be advanced one by one, it gave them plenty of time to perform the distance; whilst three others exhibited all the premonitory scorbutic symptoms. Thus only the two officers and two men could be considered as effective!

"I therefore," writes Markham, "decided to abandon the remaining boat, which would materially lessen the load to be dragged."

On the 29th May the tents were pitched close to the boat that they abandoned on their outward journey. It was exactly in the same condition as when left.

On the 31st, whilst crossing some young ice between

two heavy floes, one of the sledges broke through, and it was with difficulty that it was dragged out again.

On the 5th of June they reached land. Two days later, Lieutenant Parr started on an arduous march to the ship, in order to obtain assistance. Next day one of the invalids, George Porter, died. On the 9th a dog-sledge arrived from the ship, and on the following day a larger party, headed by Captain Nares, arrived. The ship was reached at 1.30 a.m. on the 14th of June. Out of the original party of fifteen men, three only were capable of dragging the sledge, the remaining eleven having to be carried alongside the ship on the relief-sledges.

Commander Markham on his return reported: "I feel it impossible for my pen to depict with accuracy, and yet be not accused of exaggeration, the numerous drawbacks that impeded our progress. One point, however, in my opinion is most definitely settled, and that is, the utter impracticability of reaching the North Pole over the floe in this locality; and in this opinion my able colleague, Lieutenant Parr, entirely concurs. I am convinced that with the very lightest equipped sledges, carrying no boats, and with all the resources of the ship concentrated in the one direction, and also supposing that perfect health might be maintained, the latitude attained by the party I had the honour and pleasure of commanding would not be exceeded by many miles, certainly not by a degree."

To this Nares added: "In this I most fully concur. Markham's journey, coupled with the experience gained by Sir Edward Parry in the summer of 1827, and more recently the memorable retreat of Lieutenant Weyprecht and his companions after having abandoned the *Tegetthoff* off the coast of Franz-Josef Land, proves that a lengthened journey over the Polar pack-ice with a sledge-party equipped with a boat fit for navigable purposes is impracticable at any season of the year."

It was left for Nansen and Peary to prove that Nares and Markham were wrong.

We will now follow the sledge-party to the west. After parting company with Markham on the 11th of April, Aldrich and Giffard with their two sledges crossed Feilden Peninsula—the watershed of which was estimated to be 500 feet above the sea-level. They reached the shore of James Ross Bay on the 15th. Four hares were shot and traces of ptarmigan seen. These hares were the only game obtained. Crossing the bay, Crozier Island was visited on the 17th. On the 19th, the Parry Peninsula, 2½ miles in breadth, was crossed, and the shore of Clements Markham Inlet reached. On the 22nd, Cape Colan, the west point of the inlet, was arrived at, and a dépôt of provisions left for the return journey.

On the 25th, Giffard and his crew, after completing the other sledge to forty-four days' provisions, parted company, to return to the *Alert*.

For the next seven days, when Cape Columbia was reached, Aldrich's sledge being fully laden, the daily advance was extremely slow, as usual in similar journeys, and the soft snow entailed very severe labour. On the 30th April, Aldrich wrote: "The Sergeant-Major has just shown me a very ugly-looking red patch or blotch just above the ankle; the limb is slightly swollen." This was a sign of scurvy, which was not suspected for some time afterwards. Cape Aldrich, where a dépôt of provisions was left, was reached on 1st May. Cape Columbia, the most northern point attained, was also reached on 1st May. The latitude was found to be 83° 7′ N. On the 8th of May another dépôt was formed; and on the 10th, Aldrich writes: "The men are nearly all suffering a great deal with their unfortunate legs, which appear to get worse every day. This we all feel to be very disappointing, as it affects the journey, and although stiff limbs

were expected, every one thought the stiffness would wear off in time." Milne Bay was crossed on the 14th, and the camp was pitched in Yelverton Bay on the 15th. On the 18th May, Aldrich decided to return. Provisions were running short, and the condition of his crew was becoming worse. He had then reached longitude 85° 33′ W. On the homeward journey the attack of scurvy gradually became more pronounced, and the fast-increasing weakness of the men rendered the daily distance accomplished so short that the provisions placed in dépôt on the passage out were insufficient to last them, on full allowance, while travelling from one dépôt to another.

On the 5th of June they passed Cape Columbia on their return; and on the 7th the dreaded word "scurvy" was used for the first time. The dépôt at Cape Colan was reached on the 11th. On the 13th, Aldrich writes: "Got on very fairly till eight o'clock, when Good nearly fainted. There appears to be utter inability to get breath, no pain, and no difficulty to speak of in breathing when at rest. The least exertion brings it on."

On the 20th, when it was becoming evident that they could not reach the ship without assistance, they met a party of three who had been sent to their relief. On the 23rd other two came to their assistance; and on the 25th a party of officers with Captain Nares hurried them to the ship.

The only other sledge-journey of importance was that along the Greenland coast, in charge of Lieutenant Beaumont. Accompanied by Dr. Coppinger and sixteen men dragging two sledges, he started from the *Discovery* on the 6th of April for Floeberg Beach, intending to make the *Alert* his base for the exploration. The *Alert* was reached on the 16th, and after four days' rest, Beaumont with Rawson, Coppinger, and twenty-one men, dragging four sledges weighted to 218 lb. per man,

started for Repulse Harbour, Greenland. Robeson Channel was crossed without much difficulty, but a great mass of hummocks had to be cut through at the entrance to Repulse Harbour. Here the provisions were redistributed on three sledges, a cairn built, and a site selected for the dépôt to be left for the return journey.

They started northward on the 27th April, and as it had been impressed upon Beaumont that it was necessary to keep to the land so as to prevent leaving an impassable barrier in the rear in the event of the ice breaking up, he struggled on along steep snow-slopes where roads had to be cut, rather than take to the comparatively level floes. At Black Horn Cliffs, however, it was found impossible to keep to the land; they therefore took to the ice, but again returned to the land a short distance beyond the cliffs. On the 4th of May a dépôt was formed for the return journey, and Coppinger left on this date. On the 6th of May one of the crew complained of stiffness in the legs, and next day when he was examined by Beaumont the latter suspected scurvy. On the 10th he decided that Lieutenant Rawson, with his party, should take this man back, and on arrival at Repulse Harbour either cross over to the *Alert* or go on to Polaris Bay.

On the 10th of May, Beaumont ascended Mount Wyatt, 2050 feet, from which he saw that the line of hummocks stretched for 10 or 12 miles in the direction of Mount Hooker, and then turned to the northward, and ran straight for the west end of the distant land. All to the eastward of this boundary was smooth and level, while to the westward lay the Polar pack, with its floes and chains of hummocks.

A dépôt was left at Cape Bryant, and then Beaumont made for Cape Fulford, which is the north extremity of the line of cliffs on the west side of St. George's Fiord. The road across the mouth of the fiord was very good,

and, arrived at Dragon Point, they opened out another wide reach of bays and fiords. Beaumont was anxious to reach Mount Hooker, from which he expected to see not only the islands to the north, but get the best idea of the trend of the mainland; he encountered, however, soft snow which varied from 2 to 4½ feet in depth: they had "literally to climb out of the holes made by each foot in succession." Why snow-shoes were not used seems beyond comprehension. Beaumont writes: "The shore for which we were making did not seem more than 2 miles off, so I went ahead to see if the travelling was better under the cliffs. I got about a mile and a half ahead of the sledge in three hours, and then gave it up. I was nearly done; so I hailed them to go to lunch, but would rather have missed three meals than gone back all that distance." The men struggled on, sometimes dragging the sledge on their hands and knees to relieve their aching legs, or hauling her ahead with a long rope and standing pulls.

On the 19th of May, Beaumont writes: "Nobody will ever believe what hard work this becomes on the fourth day; but this may give them some idea of it. When halted for lunch, two of the men crawled for 200 yards on their hands and knees, rather than walk unnecessarily through this awful snow." This snow was too much for them: on the 22nd May they started on the return journey without having reached Mount Hooker. A record was left in a cairn on the north end of Reef Island. At Dragon Point a chart and another record were left in a cairn, and Beaumont and Alexander Gray set off to ascend the highest mountain in the neighbourhood. The elevation was 3700 feet and the view was magnificent, but Beaumont did not see what he wanted:—"The Mount Hooker Land hid the islands, and the Cape Buttress channel was shut in. Mount Albert I could see was a separate

island. Cape Britannia, as far as could be seen, had very high land far back. Stephenson Land was quite hidden behind Mount Hooker Land, which latter towards Cape Buttress extended very far back to the eastward. Cape Buttress overlapped it, but inside and above the cape could be seen either a hummocky floe or a *mer de glace*; it looked like a floe, but its skyline had a perceptible curve in it—a haze hung over this part. By the look of the land and shore, a passage seemed to connect St. George's Fiord with St. Andrew's Bay. St. George's Fiord could be traced continuing to the south, after making a slight bend to the west. The view inland in that direction stretched away without a break as far as the eye could reach, all much about the same elevation. Mount Punch stood out from most of the other mountains, and Grant's Land was distinctly visible, the United States' range being very conspicuous."

After a short rest, they once more started, making for Cape Fulford. Heavy snowfalls with thick fogs retarded their advance, and on the 28th of May a dépôt was formed with 200 lb. of articles which they could dispense with. With the exception of Beaumont and Gray, all the party were suffering from scurvy, and steadily getting worse. Soon after this, Paul fell down quite powerless, and had to be carried on the sledge; and on the 7th June another man had to be placed beside him. Repulse Harbour was reached on the 10th of June. It was decided to cross over to the *Alert*, but after travelling about 1 mile over the ice they came to water, and had to return and make their way to Polaris Bay, 40 miles off. Next march Dobing broke down, and Jones felt so bad he did not think he could walk much longer. They toiled painfully through McCormick Pass, and reached Newman Bay. On the 22nd, Craig and Dobing almost dragged themselves along, their breath failing entirely at every 10 yards.

On the 23rd it became necessary to carry both Dobing and Craig. The last journey under such terrible conditions may be described in Beaumont's words: "On the evening of the 24th we started for our last journey with the sledge, as I thought; for finding that Jones and Gray were scarcely able to pull, I had determined to reach the shore at the plain, pitch the tent, and walk over by myself to Polaris Bay to see if there was any one there to help us; if not, come back, and sending Jones and Gray, who could still walk, to the dépôt, remain with the sick and get them on as best I could. But I thank God it did not come to this, for as we were plodding along the now water-sodden floe towards the shore, I saw what turned out to be a dog-sledge and three men, and soon after had the pleasure of shaking hands with Lieutenant Rawson and Dr. Coppinger. Words cannot express the pleasure, relief, and gratitude we all felt at this timely meeting."

Newman Bay dépôt was reached next day. Hans, who arrived with Rawson and Coppinger, made good use of his skill as a driver. Both Paul and Jenkins were now in a critical condition, so it was decided on the 28th that Dr. Coppinger and Hans, with the two men on the eight-man sledge drawn by the dogs, should start for the Polaris Bay dépôt. Paul, however, gradually grew weaker, and died on the afternoon of the 29th.

It will be convenient here to go back to Rawson's journey to Polaris Bay after leaving Beaumont. Owing to two more of his crew breaking down, leaving only himself and one man, E. Rayner, strong enough to drag the sledge, they did not succeed in reaching Polaris Bay till the 3rd of June, after a most arduous journey on reduced rations, and during several days of which Rawson was himself so badly affected with snow-blindness that he had

to pull the sledge while blindfold. James Hand expired a few hours after their arrival at Polaris Bay.

On the 8th August, Beaumont with his companions started on their perilous journey across Hall's Basin to Discovery Bay. After two hours on the ice, they came to a large space of water 3 miles broad, and launched their boat, which had previously been taken across from the *Discovery*. They had repeatedly to draw the boat on the ice, haul it on their sledge till water was again met, and then launch. While crossing they found themselves drifting south, and were in the greatest danger of being swept into Kennedy Channel; fortunately, a wind from the south-east set in, and they eventually reached land between Cape Lieber and Cape Baird on the 12th, and arrived at Discovery Bay on 14th August.

After the return of the northern and western sledge-parties so completely broken down, Captain Nares determined to give up all further exploration, and to proceed to the southward with both ships as soon as the ice should break up and release them. On the 31st July the *Alert* succeeded in escaping from the ice at Floeberg Beach, and after meeting many difficulties reached Discovery Bay on 12th August.

Nares writes: "On the 16th, the weather still remaining distressingly fine and calm, an excursion was made to the coal-beds near Cape Murchison. This deposit of coal, or, more correctly, lignite, is exposed in a ravine near Watercourse Bay, for a distance of over 200 yards. At its greatest exposure the thickness of the seam is 25 feet, but we had no means of ascertaining how much deeper it descended below the level of the stream. Above the coal are beds of shale and sandstones. The coal was pronounced after trial by our engineers to be equal to the best Welsh. The seam where exposed is at an elevation of about 200 feet above

the sea-level, and at a distance of about a mile from the shore of Watercourse Bay, in Robeson Channel. Unfortunately, very little shelter is obtainable for a large vessel among the small floebergs stranded in this indentation. The distance between the coal-seam and Discovery Bay is about 4 miles, and the track leads over the brow of a hill about 800 feet high.

"A short distance above the quarry, in a narrow part of the ravine where a large quantity of snow, collected in a shaded part, remains unmelted during the summer, the mountain torrent has melted away a watercourse for itself through the snow-bank. In winter this ice grotto, with a trifling expense of labour, could be readily formed into a convenient Arctic residence."

On the 18th August, Captain Stephenson deposited an account of their proceedings in a cairn which had been constructed out of the empty preserved meat-tins, refilled with gravel. A post-office box was placed in the centre of the pile.

On the 20th August the ice opened sufficiently to allow the two ships to leave for the south. At Cape Isabella they found a package of letters and newspapers left there by Sir Allen Young a few weeks previously.

Nares writes: "After our long sojourn within the Polar ice it was a strange transition to feel the ship rise and fall once more on the 'north water' of Baffin's Bay, and to look astern and see Cape Isabella, one of the massive portals of Smith Sound, fading away in an obscurity of snow and midnight darkness; whilst an ice-blink stretching across the northern horizon reminded us forcibly of the perils, dangers, and anxieties that we had contended against for so many months.

"In comparing the voyage of the *Polaris* and that of the *Alert* and *Discovery*, it is evident that the navigation of the ice which is to be met with every year in

Kane Sea is entirely dependent on the westerly winds. Both in 1875 and 1876 we met navigable water off Cape Victoria in latitude 79° 12′ with only a narrow pack 15 miles in breadth between it and Grinnell Land, which a westerly wind of a few hours' duration would certainly have driven to the eastward. The same wind would have opened a channel along the shore, and any vessel waiting her opportunity at Payer Harbour could under those circumstances have passed up the channel with as little difficulty as the *Polaris* experienced in 1871.

"The quantity of one season's ice met with in the bays on the south-east coast of Grinnell Land in 1876 proves that on the final setting in of the frost, after we passed north in 1875, the pack had been driven from the shore, leaving a navigable channel along the land. Nevertheless, I do not recommend future navigators who wish to obtain a high northern latitude by this route to wait for such a favourable occurrence. Certainly no one could have made a passage through the ice in 1876 before the 10th September by doing so. At that date the season had advanced so far that the attainment of sheltered winter-quarters would have been extremely problematical."

The two ships arrived at Portsmouth Harbour on the 2nd November.

This expedition, sent out regardless of expense, achieved very much less than had been anticipated. The chief cause of failure was the outbreak of scurvy, which completely paralysed the undertaking. The real cause of the outbreak was never discovered, but it was probably due to the want of fresh meat. The methods adopted to reach a high latitude were practically identical with those of Parry used half a century before. After all their experience, both Markham and Nares emphatically

declared their conviction that it was impossible under any circumstances for a sledge-party, even without boats, and with all possible resources, to reach 1 degree beyond that reached by the expedition. It was an American naval officer, Commander Peary, who proved in 1906 that a point nearly 4 degrees farther north could be attained over the same sea; and in 1909, starting from the coast a little to the west of his previous route, he succeeded in reaching the Pole itself.

CHAPTER VIII

THE VOYAGE OF THE *JEANNETTE* (1879–81)

The *Jeannette* was the new name given to Sir Allen Young's *Pandora* after it was purchased by James Gordon Bennett, who had decided to equip a North Polar expedition.

The commander of the expedition, Lieutenant George W. De Long, had taken an active and distinguished part in the search for the *Polaris*. In making an attempt to reach the Pole, he favoured the route by Behring Strait, and he was supported by Bennett himself, who had been influenced by the views of Dr. Petermann, the German geographer. One of the chief reasons for choosing the Behring Strait route was the supposed existence of a Japan current, which, it was hoped, would open a way towards the Pole. Another reason was the view held as to the extent of Wrangel Land. Petermann actually believed that it extended right across the Pole and was the continuation of Greenland. It was afterwards proved to be only a small island.

Lieutenant Chipp, the second in command, acted with De Long in the search for the *Polaris*. George W. Melville, chief engineer, had been a comrade of De Long's in the navy. The ice-pilot was William Dunbar, who had been master of whale-ships in and north of Behring Strait. Nindemann, the ice-quartermaster, was one of the crew of the *Polaris* who underwent the terrible winter-drift on the ice-floe.

The *Jeannette* left San Francisco on the 8th July 1879. A schooner, laden with 100 tons coal and such provisions as the *Jeannette* could not conveniently carry, followed on the same date.

Ounalaska Island was reached on the 2nd August, and left on the 6th. Here, coal, dog-food, and furs were obtained. De Long mentions that there was not a white woman in the place. The native women evidently do not expect a long courtship. A number of men had been brought from St. Paul's Island on the Thursday; they made their selections on the Friday and Saturday, and were married on the Sunday.

St. Michael's was reached on 12th August, but the schooner did not arrive until the 18th. Here, forty dogs, five sledges, snow-shoes, boots, and a large quantity of skin-garments were obtained. Two natives, named Alexey and Aneguin, were hired as interpreters and dog-drivers. The total number of persons on board the *Jeannette* was now thirty-three.

De Long had been instructed to make inquiries concerning Professor Nordenskjöld, who had nearly reached Behring Strait in making his famous north-east passage during the previous year. For this purpose he left St. Michael's on 21st August, and made for St. Lawrence Bay, Siberia, which he reached on the 25th, after a stormy passage. Here he ascertained that a ship which had been frozen in during the previous winter in Koliutchin Bay, had left St. Lawrence Bay some time before. De Long believed that this must have been Nordenskjöld's ship, but to make certain he decided to make inquiries near where the Professor wintered. He visited Koliutchin Bay, and found satisfactory proof that Nordenskjöld had wintered there, and had left in safety. It was now the 31st August, and De Long was free to continue his voyage to the north, but unfortunately the navigation

season was drawing to a close. The lateness of the date when the *Jeannette* left San Francisco, her want of speed, and the delay caused by her search for Nordenskjöld placed De Long at a great disadvantage.

Pack-ice was met as early as the 2nd September. Herald Island was sighted on the 4th, and on the same date land was seen away to the south-west.

On the 6th September the *Jeannette* was beset, within a week after leaving the Siberian coast, and was never afterwards released. On the 9th September the position by observation was found to be 71° 35′ N., 175° 5′ 48″ W.

On the 13th September, De Long sent four men with a sledge to make an attempt to reach Herald Island. They returned next day and reported that they had been forced to return when about 5 miles from the island. Broad leads and rotten ice had been met, and it was evidently impossible to sledge to the island.

By this time it was observed that the *Jeannette* was being slowly drifted in the ice towards the north-west. On the 15th September the position was 71° 46′ N., 175° 36′ W., or about 15 miles to the north-west of the position on the 9th. All hope of getting out of the ice before next summer was now almost given up, and the best that could be expected was that the *Jeannette* might drift to Wrangel Land before spring. However, after drifting some distance to the north-west, the *Jeannette* was drifted to the east, and then to the south-west, thus forming a triangle, and after a month's drift she reached a point near where she began.

On the 21st October the thermometer fell to zero for the first time. Preparations were made for the winter, and De Long took great precautions to see that everything possible was done to insure the health of the party. Special attention was paid to the proper ventilation of the ship and the avoidance of damp. The surgeon,

Dr. Ambler, frequently tested the amount of carbonic acid gas in the air; and a thorough examination of the whole party was made monthly.

During October the land to the south-west of Herald Island was frequently seen, and De Long came to the conclusion that it was Wrangel Land, and must either be an island or an archipelago.

Before the sun disappeared on the 16th November a considerable number of seals, several bears, and some walruses had been shot, and served as an important addition to the stock of food for both men and dogs.

During November ice pressures became severe. On the 24th, the floe in which the *Jeannette* had been fixed was split, and the ship was once more afloat, but in a most dangerous position. On the 25th, it was driven by the ice about a mile from its previous position, until it held fast in some young ice.

At this time considerable difficulty was experienced in obtaining water of proper purity. There was little snow on the ice, and what there was contained a large quantity of salt, due to the wind drifting it and mixing it with the salt on the surface of the ice. It was therefore necessary to commence distilling.

The ice pressure was much less severe during December. From the 2nd to the 18th the change of position was only 8 miles towards the west. Christmas was passed merrily. About the end of December, Danenhower, the navigator of the ship, began to suffer from an inflammatory trouble in one of his eyes, from which he did not recover during the remainder of the cruise.

The year 1880 was ushered in by a minstrel entertainment given by the crew. On the 19th January the disagreeable discovery was made that the ship was leaking seriously. The ice pressure had evidently caused serious

injury. On examination it was found that the water already stood 3 ft. in the forehold.

The deck-pumps were at once manned, and fortunately were able to keep the water in check until steam could be raised to work the steam-pump. This was a serious drain on the small supply of coal, but Melville was equal to every emergency. He ultimately succeeded in pumping by means of a windmill. Every effort was made to stop the leak, and although partly successful, pumping had to be resorted to more or less continuously throughout the remainder of the cruise. Nindemann and Sweetman took turns about in standing in the water in the fore-peak building a bulkhead across it. For this work they received high commendation from De Long.

On the 26th January they had the pleasure of welcoming the reappearance of the sun. On the 1st of February a bear was killed, and as no fresh meat had been available for some time, this was a welcome addition to the stock of food. Another bear was killed on the 2nd, and when the stomach was examined it was found to contain only a few small stones.

On 6th March 1880 the position of the ship was 72° 12′ N., 175° 30′ W., which was only 26′ north and 6′ east of the position on the 15th September 1879. This proves the absence of a definite current. The depth of water varied from 30 to 40 fathoms, and the bottom usually consisted of blue mud. On the 20th March, De Long stated that he was now convinced that the drifting during the winter had been entirely caused by the winds, and not by any current. During March the north side of Wrangel Land was frequently visible.

On the 1st of May the sun could be seen at midnight. On the 5th May the position was found to be 73° 11′ 24″ N., 179° 37′ 30″ E., indicating a considerable drift since the beginning of March. It also showed that the

180th meridian had been crossed. On the 20th May the stock of coal amounted to only 60 tons, and De Long became impatient to get out of the ice. The total drift towards the north-west during the month of May was very good, amounting to 82 miles.

The drift during June was nearly the reverse of what it was during May, the *Jeannette* at the end of the month being 50 miles south of where she was at the beginning of it. There was still no sign of release from the ice, and the consequent disappointment was very great.

During July the temperature was usually near freezing-point, and yet De Long felt the cold much more than when the temperature was 30° below zero. The latter was what he described as a hard, dry cold, whereas the former was a soft, wet cold that penetrated at once. At the end of the month they were back again to the 180th meridian; the summer had nearly gone, and still there were no signs of a change. The monotony of waiting for "something to turn up" was found extremely trying.

On the 1st of August one of the dogs died, and on a post-mortem being made it was discovered that the dog's death was caused by his swallowing a sharp bone, which cut through his intestines. Several other dogs were lost from the same cause.

Throughout the cruise, De Long took the strictest precautions to see that the water used for drinking and cooking was as free as possible from salt. After very thorough investigation, he arrived at the conclusion that sea-water ice, under whatever circumstances it may be found, is a treacherous and unsafe element to use.

The drift during August amounted to about 50 miles towards the north-east. The navigable season was now nearly at an end, and another monotonous winter in the pack awaited them. At the end of twelve months the

Jeannette was only 150 miles from the point where she was first beset.

Preparations for winter had again to be made: a deck-house was erected, a porch was built around the cook-house, snow was banked against the ship's side, and various alterations were made for the greater comfort of the crew. On the 29th September, when fresh meat was nearly gone, a bear weighing 943½ lb. before skinning was killed, and another was obtained next day.

The sun disappeared on the 6th November, and on this day the temperature was 30° below zero at noon. Severe ice pressures were again experienced, but did not excite so much alarm as did those of the first winter. On the 30th November the 74th degree of latitude had been reached for the second time.

A bear weighing 800 lb. was killed on the 2nd December. On the 11th December the temperature was 39° below zero, and the ice gave loud reports like the discharges of heavy guns. De Long believed that the noise was due to the splitting of the ice under contraction caused by the intense cold. At midnight on the 15th December the temperature was −48°. On the 21st a post-mortem was made on another dog, and the cause of death was ascertained to be the presence in the intestines of several mutton-bones, two pieces of a tin can, a piece of cloth, and the fag end of a rope. Christmas Eve was spent in the enjoyment of a minstrel entertainment, and Christmas had a more than usually elaborate dinner, consisting of soup, roast seal, apple jelly, tongue, macaroni, tomatoes, mince pies, plum pudding, figs, raisins, dates, nuts, candy, chocolate, and coffee.

The year 1881 was welcomed by another entertainment by the "Jeannette Minstrels." The ship was now 220 miles north-west of where it was first beset, and the whole party, with the exception of Danenhower, were in good

health. No serious case of frost-bite had occurred, although both officers and men were frequently out on the ice when the temperature was more than 40° below zero. On the 27th January the latitude was 74° 20′ 56″, the highest yet attained.

The sun was again seen on 5th February, so that their night had been 91 days, against 71 of the previous year. On the 14th the 75th parallel was reached, and soundings gave 44 fathoms. Next day great astonishment was caused when the lead-line gave 57 fathoms. A bear was killed on the 18th.

During March, as the latitude increased, so did the depth of water. On the 17th it was 67 fathoms, and on the 19th, 71 fathoms; latitude, 75° 15′. On 8th April, in latitude 75° 46′, the depth was 75½ fathoms; and in 75° 53′ 30″, on the 16th, it was 84 fathoms.

The 76th parallel of latitude was reached on the 21st April, and during the next four days the drift towards the west was no less than 47 miles.

On the 16th May great excitement was caused by the discovery of land. The latitude on this date was 76° 43′ 20″ N., and longitude 161° 59′ 45″ E. The land was only a small island, Jeannette Island, but its discovery caused great rejoicing among the party, who had looked at nothing but ice and sky during fourteen months. Another island, Henrietta Island, was discovered on the 24th May. The latitude on this date was 77° 16′.

On 31st May a party of six in charge of Melville started for Henrietta Island. They took a light boat, a sledge and fifteen dogs, and seven days' provisions. De Long wished to know whether there was any bay in which he could place the ship, and whether there was animal or bird life with which he could replenish his waning stock of provisions.

On the 1st of June the doctor made the startling an-

nouncement that several of the party on board were suffering from lead-poisoning. An examination was made, and traces of lead were found in the water, and in still larger quantity in the tomatoes. It was supposed that the juice of the tomato had acted on the solder used in the tins.

The Henrietta party returned on the 5th June. They landed on the island on 2nd June, and left a record in a cairn. The island was found to be desolate rock, surmounted by a snow-cap. The cliffs were inaccessible; and dovekies nesting in the face of the rock were the only signs of life.

On the 10th of June the ice suddenly opened alongside the ship, which settled down nearly to her proper bearings. There was now a small canal on the port side, and into this De Long had a heavy floe hauled so as to receive the pressure in the event of the ice closing. This was at first successful, but later the ice closed in with great force, jamming the ship hard against the ice on the starboard side, and causing her to heel 16° to starboard. Orders were at once given to lower the starboard boats and haul them to a safe position. Melville, while below in the engine-room, saw a break across the ship in the wake of the boilers and engines, and it was evident that the ship was breaking in two. Orders were now given to remove sledges and certain provisions which had long been kept in readiness in case the ship might have to be abandoned. At 4.30 p.m. there was a lull in the pressure, and De Long began to hope that the worst was over, but at 5 p.m. the pressure was renewed with tremendous force. Everything needful for a retreat over the ice was now hurriedly removed to a place of safety. At 6 p.m. it was found that the *Jeannette* was beginning to fill, and at 8 p.m. everybody was ordered to leave the ship. At 4 a.m. of the 12th the *Jeannette* disappeared beneath the water, in latitude 77° 14′ 57″ N., longitude 154° 58′ 45″ E.

Preparations were at once begun for the retreat to the

Siberian coast. The first and second cutter and the whale-boat had to be mounted on their travelling-sledges; bags had to be made to hold bread, tea, coffee, and sugar; and sledges had to be overhauled and relashed. To get their weights as exactly as possible, they had to start with an ounce weight and the doctor's scales, and work up by a number of Remington cartridges to a pound. Two empty meat-tins tied to the end of a stick suspended by its centre formed the scale.

During this time they lived on plenty of food, as they had saved more than they could take with them. The clothing allowance for each officer and man was limited to what he was actually wearing and the contents of a packed knapsack.

All arrangements having been made, the start to the southward began on the evening of the 18th June. The party had three boats, seven sledges, and twenty-three dogs. Dunbar was sent ahead to select a route and plant flags for the party's guidance. Danenhower, Chipp, Alexey, and Kuehne were on the sick list, but could walk. The five McClintock sledges carried 1659 lb., 1318 lb., 1252 lb., 1342 lb., and 1325 lb. respectively. During the first day these loads were found to be too heavy, and De Long saw that instead of being able to advance the boats and provisions in three separate hauls as he had hoped, he must be satisfied if he could do it in six. It was therefore necessary to repack the sledges. Even with the lighter loads, the runners of the sledges were frequently doubling under during the first few days. On the 20th June it rained steadily for eight hours, and instead of starting as usual at 6 p.m., the party did not get off till 2.30 a.m. of the 21st. Openings in the ice were already met, and caused great delay. Small ice-floes had to be dragged into position to form a bridge over which the sledges were dragged.

On the 25th June, after a severe week's work, De Long obtained his first opportunity of ascertaining his latitude. His feelings may be imagined when he found that he was 28 miles farther north than where he started from a week before! He wisely kept this discouraging fact from the knowledge of the general party. He now altered his course from south to south-west. On this date Chipp was so weak that he had to be carried on a sledge.

On the 26th June five bridges had to be built over leads: the heaviest sledge fell into the water, but was dragged out; and Melville went in up to his waist. On the 27th eleven hours' hard work carried them only $1\frac{1}{4}$ mile. One lead 40 feet wide, and another 60 feet wide, had to be crossed. Yet under all these difficulties everybody was bright and cheerful. It was no uncommon thing to have four leads to bridge in half a mile, and sometimes as soon as one was bridged another opened in the rear. Over this rough and ever-changing path six, and sometimes seven trips had to be made. It is not to be wondered at that the work was terribly laborious, and progress slow.

On the 3rd of July the latitude was found to be 15 miles farther south than on the 25th June, so that the drift had not been against them. The 6th July was a wet and stormy day, and the party remained in their tents until 6 p.m. of the 7th. On the 9th they were well satisfied with an advance of 3 miles. On the 10th July some excitement was caused by the appearance of land to the south-west. De Long was doubtful whether it was really land, but next day from the top of a hummock he saw unmistakable land, and also water.

Cocoa and chocolate were now exhausted, and the tea was reduced to half an ounce per man. The ice became comparatively loose, and boats and sledges had to be continually ferried across large openings on small floes. On the 13th July the first serious breach of discipline

among the crew took place. E. Starr, one of the seamen, found a pair of wet soles on his sleeping-bag. He flung them some distance on the ice, in a temper, and refused to pick them up when ordered to do so by Melville. For some time he also paid no attention to De Long, who at once put him off duty.

On the 15th July a seal was shot, and proved useful both for food and grease for leaking boots. Another seal was obtained on the 16th, but on the other hand 270 lb. of pemmican was lost through the capsizing of a dog-sledge. On this day also De Long was unfortunate enough to break through the ice when jumping across an opening, and went up to his neck in the water.

On the 20th July a walrus was shot and secured. The choice pieces were used by the party, and the rest went to the dogs. The skin was cut into pieces and divided for boot-soles. They had now to contend with a moving, rotting pack, and they were greatly hindered by fog. Leads were continually opening and closing, and large blocks of ice were being swirled around, and carried first west and then east. On the 24th they had the good fortune to kill a bear. On the 25th land seemed quite close at hand, but after working 24 hours they had again to camp on the ice. Fog delayed the next start till the evening of the 27th, when they again hoped to reach land, but within half a mile of it they were stopped by broken ice, and had again to camp. On the 28th, after great difficulties, the land was at last reached. De Long took possession of it in the name of the President of the United States, and named it "Bennett Island." After crossing the 180th degree of longitude, De Long should have advanced his date one day, but he did not do so, as the *Jeannette* was sometimes drifted east and sometimes west of this line. At Bennett Island he corrected the date, so that possession of it was taken really on the 29th July.

Preparations were now made to take tidal observations, make sketches, collect natural history specimens, and hunt for game, etc. Large quantities of driftwood were scattered about the shore, and Melville found a vein of bituminous coal. The face of the cliffs was alive with dovekies, of which they obtained a fair number.

Bennett Island was left on 6th August, after a record had been deposited in a cairn. Ten of the poorest dogs were shot, leaving twelve. On the 7th the party were able to take to their boats, and the men were distributed as follows:—In first cutter, De Long, Ambler, Collins, Nindemann, Ericksen, Kaack, Boyd, Alexey, Lee, Noros, Dressler, Görtz, Iversen. In second cutter, Chipp, Dunbar, Sweetman, Sharvell, Kuehne, Starr, Manson, Warren, Johnson, Ah Sam. In whale-boat, Melville, Danenhower, Newcomb, Cole, Bartlett, Aneguin, Wilson, Lauterbach, Tong Sing, Leach.

Soon after the boats started, four of the dogs jumped out and were lost. Two St. Michael's sledges and four McClintock sledges had been left behind. On the 8th August other four dogs jumped from the boats, and two dogs were shot, leaving only two.

A good deal of ice was still met with, and the boats had frequently to be hauled on the ice and dragged across until open water was again found. A seal was shot and secured on the 11th August. On this date they calculated that they had advanced about 20 miles. Another seal was obtained on the 15th, and as provisions were now running low, it was very acceptable. The last ration of bread was served out on the 18th. On the 19th the ice closed on the second cutter and stove a hole in the bow. Chipp repaired it with a piece of Liebig box. On the 20th August land was seen to the south-west. Preparations were now made for sea. Snow was melted for water, and the boats overhauled, etc. On the 21st, how-

ever, before they could start, the ice had closed around them, and it was not until the 29th that they were able to take to the water.

On the 30th August they reached and landed on Faddejew Island. The "Faddejew Hut" marked on the Russian chart was found tumbling to decay. The island was left on the 31st August. On the 1st September the second cutter was separated from the other two boats, and did not rejoin them till the afternoon of the 3rd. In order to let Chipp have a better chance of keeping up with the other two boats, De Long ordered one man, Ah Sam, to his party, and another, Manson, to go in Melville's boat. This resulted in the saving of Manson's life.

On the 4th September they landed on a low beach running out from the island of Kotelnoi. Some of the party, next day, came across several ruined huts, and in one of them was found an elephant tusk, a wooden cup, a spoon, and a fork.

Kotelnoi Island was left on the 6th September. Semenooski Island was reached on the 10th, and on this day the last of Liebig's Extract was used. It had been much liked by the party. On this small island they were fortunate in killing a deer. They rested here till the 12th, and on leaving deposited a record. They had still seven days' provisions, and De Long hoped to reach the Lena without difficulty.

A breeze sprang up on the afternoon of the 12th, and at 9 p.m. De Long lost sight of the whale-boat ahead, and at 10 p.m. he lost sight of the second cutter astern. The wind had now freshened to a gale. On the 13th there was a tremendous sea, and the boat shipped a good deal of water. An attempt was made to ride out the gale under the lee of a sail, but after doing well for an hour, the sheet parted, and sail and yard were lost. Nothing more was seen by De Long of the other two boats.

Land was sighted on the 16th September, but when more than a mile from the shore the water was not deep enough to float the boat. They passed a miserable night attached to some thin ice, and next morning several attempts were made to reach land in the boat, but it always grounded. A raft was then made, and on this were placed tents, cooking-stoves, and boat-box. All the party had to wade knee-deep 1½ mile to the shore. After a second load was landed, the boat was dragged to within half a mile of the land. The remainder of the load had then to be carried. This was completed at 10.20 p.m. in a snowstorm.

They rested over Sunday, 18th September, and set out on the 19th to walk to a settlement believed to be 95 miles distant, on the Lena River. They had about 3½ days' rations. Everything not absolutely necessary was cached, and a record left in the instrument-box. Even then it was found soon after starting that the loads were too heavy, and log-books, stove, some alcohol, a tent, and binoculars were sent back to the cache. The road was bad, several of the men were lame, and occasionally they were wading up to the knees.

On the 20th September another tent was left behind, as they found they could not carry it. The day's march took them over ponds with thin ice, and mossy swamps. Ericksen had frost-bitten feet, and kept the rest of the party back. At the end of the fourth mile De Long was compelled to halt and open the last tin of pemmican. On starting out again, they struck deer-tracks, and this gave great encouragement. They accordingly pushed ahead, but soon afterwards De Long was informed that Ericksen had lain down and desired to be left. De Long and the doctor went back and got Ericksen on his feet again, but he was in a serious condition, and it was evident that the progress of the party would be slow if they were all to keep together. Nindemann and Alexey were sent

ahead to trace the deer, but they were unsuccessful, although they saw a herd of seven or eight. They were again sent off, accompanied by Collins, and the remainder of the party camped. De Long decided that if game were not obtained he would send a small party forward to bring relief. Next day, however, he pushed on again, although no game had yet been obtained. On this march they came to two huts, and De Long decided to halt here. It was his intention to send the doctor and Nindemann on next day for relief. Alexey, however, who had been sent to examine some hut-like objects, found deer-tracks, and as they seemed fresh, he followed them, and was successful in killing two deer. He cut off a hind-quarter of meat and set off for the hut. When he arrived, the remainder of the party had retired for the night, but when the announcement was made that deer had been obtained sleep was forgotten. Cooking soon began in both huts, and the whole of the meat was consumed, with the exception of two tongues, before they felt satisfied.

De Long now decided to remain at the huts and rest another day and live on the deer. It was not, however, till two days had passed that a fresh start was made. A record of the movements of the party was left in one of the huts. De Long also left his Winchester rifle.

On the 24th September they passed a wretched night. Beds were made of a few logs, and wrapped in their blankets the party tried to sleep, but could not, and in the morning they were all cold and stiff. On the 25th the remainder of the deer-meat was eaten for dinner. At night two other huts were reached, and here they halted. Next day they had only food for three more meals. They had also one dog.

On the 27th September another deer was shot, and the danger of starvation was again averted. The hungry men at once commenced eating fried deer-meat, and took about

3 lb. each. The party then went on again, but Ericksen's foot was very bad, and progress was slow.

On the 28th September they came to a point where they had no alternative but to cross a river a quarter of a mile wide. No wood could be obtained to build a raft large enough for the purpose, and they were forced to stay here in an old hut until 1st October, when the river had frozen over sufficiently to allow them to cross.

A large gull was shot on the 29th, and with this they made soup. Fires were made when it was dark at night, in the hope of drawing attention. On the 30th the doctor removed several of Ericksen's toes.

On the 1st October a record was left in the hut, and the party then crossed the river with Ericksen on a sledge. De Long now saw that the chart in his possession was practically useless. He had been hoping to reach a place marked on the chart as "Sagastyr," but he now looked upon this as a myth.

On the 2nd and 3rd they struggled on, and had to camp in the open at night. On the 3rd October the last of the pemmican was eaten, and nothing now remained but the dog, which was killed for supper. De Long and other two men broke through the ice during the day's march and got thoroughly wet. At night they tried to dry themselves before a fire of driftwood. Ericksen groaned and rambled in his talk, and the whole party spent a most miserable night. On the morning of the 4th they moved to a hut which had been discovered by Alexey the previous night. From his chart De Long now arrived at the conclusion that he was on Tit Ary Island, and about 25 miles from Ku Mark Surka, which he took to be a settlement. It may here be mentioned, as indicating the worthless character of De Long's chart, that instead of being at Tit Ary Island as he supposed,

he was about 120 miles from it, and Ku Mark Surka lay 33 miles beyond that.

Ericksen died on the 6th, in the hut. He was buried in the river, and a board with his name was stuck in the river-bank abreast of his grave. A Winchester rifle, some ammunition, and a record were left in the hut, and the party again moved on. The last of the dog-meat and the last of the tea were used for breakfast. Some old tea-leaves and 2 quarts alcohol were all that remained. Towards night, Alexey obtained a ptarmigan, and with this soup was made. Breakfast on the 8th consisted of 1 oz. alcohol in a pint of hot water. Dinner and supper were the same.

On the 9th October, Nindemann and Noros were sent ahead for relief. They carried their blankets, one rifle, 40 rounds ammunition, and 2 oz. alcohol. The remainder of the party followed an hour afterwards. During the march they all broke through the ice, and were wet up to the knees. They stopped and built fires, and tried to dry their clothes. Alexey shot three ptarmigans, with which they made soup. For supper they had only half an ounce of alcohol.

On the 10th October the last of the alcohol was taken for breakfast, and they began to eat deer-skin scraps of clothing. Lee showed signs of collapsing, and wished to be left. For supper they had a spoonful of glycerine. "All hands weak and feeble, but cheerful."

On the 11th there was a gale of wind with snow, and they were unable to move. On the 12th the last of the glycerine was taken for breakfast. For dinner they tried two handfuls of Arctic willow infused in water. On the 13th willow-tea was again taken On the 14th, Alexey shot a ptarmigan, and soup was made. On the 15th the willow-tea was again repeated, and two old boots were eaten.

All this time they were hoping to hear from Nindemann

and Noros. On the 16th October, Alexey broke down, and died on the 17th. After this, no food was obtained. Lee and Kaack died on the 21st, Iversen on the 28th, Dressler on the 29th, Görtz on the 30th October. On the latter date Collins was dying. Here the record of De Long ceases. The doctor and Ah Sam must still have been alive.

It will now be convenient to follow the fortunes of Nindemann and Noros, who were sent for relief. During their first march, on the 9th October, Nindemann shot a ptarmigan, which served for their dinner. At night they made a fire, drank willow-tea, and tried to obtain a little nourishment from a burned boot-sole; then wrapping themselves in their blankets, they lay down near the fire. For breakfast next morning they had a little willow-tea and another boot-sole. Their course along the main stream was a confused morass, and they were hindered by a high wind and drifting snow. At night they made a hole in a snow-drift, in which they camped. The wind was so high that although there was driftwood, a fire could not be lighted. At noon on the 11th they stopped and kindled a fire, meaning to heat a little of the alcohol which they carried; but Noros, who had it in his pocket, found the bottle broken and the alcohol lost. They had therefore to fall back on willow-tea and boot-sole. At night they reached a hut in which they found some deer-bones. A fire was kindled and the bones charred, and an effort was made to eat them. Next morning a gale was blowing, and nothing could be seen but drifting snow. They had therefore to remain in the hut. The journey was resumed on the 13th. A hut was seen on the opposite bank of the river, and an attempt was made to cross the thin ice. They repeatedly went through up to their waists, but finally succeeded in gaining the bank. Noros while

searching for firewood found a box containing two fish. Nindemann was fortunate enough to seize a lemming, and on this and the fish they made their supper. The fish were almost rotten, but they were soon devoured. Next day they made a start, but were driven back by drifting snow to the hut, where they stayed another twenty-four hours.

On the morning of the 15th October another start was made along the river-bank. The night was passed in a kind of cave at the side of the river. Their supper consisted of a piece of seal-skin pantaloons, which was soaked in water and then burned to a crust. They passed a wretched night. Next day they made for some hills they saw in the distance. No willow could be found, and a piece of seal-skin was their only food. They passed the night in a ravine, where they dug a hole in the snow.

On the 17th they struggled over streams and sand-spits, and had again to pass the night in a hole in the snow. The wind was too high to allow a fire, and it was too cold to allow sleep. On the 18th they reached a ruined hut almost filled with snow. They cleared out sufficient to give them sleeping-room, and after taking some willow-tea and a piece of seal-skin, they lay down for the night. On the 19th they were so weak that they had to rest about every five minutes. In the afternoon they reached three huts, and in one of them was a kayak containing something like sawdust. It was blue-moulded and tasteless, but it was believed to be fish. As they found nothing more, they ate it, and soon after they had an attack of dysentery. They stayed in the hut all day, and on the 21st found themselves too weak to move farther.

On the 22nd October they heard a noise outside, and Nindemann, when he looked through a crack in the door, saw something move, and thought it was a reindeer. He

took down the rifle and was moving to the door when it opened, and at the entrance stood a man. Seeing Nindemann with the rifle, he expected to be shot, and immediately fell on his knees and began to supplicate. Nindemann threw the rifle down and beckoned eagerly to the man to come in. After some hesitation, the stranger entered, and the two men, anxious to be friendly, offered him some of the fish. He shook his head, and made signs that it was not fit to eat. Nindemann and Noros went out, and found that the man had come in a sleigh with reindeer; but there was nothing to eat. He gave Nindemann a pair of deer-skin boots and a deer-skin, and in return Nindemann gave him a shirt. The man made signs that he would require to go, and held up three or four fingers to indicate that he would return. Whether he meant in three or four hours, or three or four days, they could not tell.

About 6 p.m. the man returned with two others, and brought a frozen fish which he skinned and sliced. They also brought some deer-skin coats and boots for them, and then made signs that Nindemann and Noros were to go with them. The latter made various attempts to make the natives understand the critical condition of De Long and party, but utterly failed. Putting Nindemann and Noros into the sleighs, they drove off with them along the river to the westwards. They kept on their drive for about 15 miles, when they came to a couple of deer-skin tents. Here Nindemann and his companion received boiled venison. The natives numbered seven men and three women. One of the women gave Nindemann water in order that he might wash, but as he found himself unable to use it, she took pity on him and washed his face. Again attempts were made to make the natives understand about the party, but it was impossible to say how far they were understood. Next day

over one hundred head of deer were harnessed to twenty-seven sleighs loaded with reindeer meat, skins, and fish, and driven over the mountains to the southward. About the end of the second day they came to a collection of huts, Ku Mark Surka, where there was a great crowd of people feasting. On the following day, the 25th October, Nindemann made another desperate attempt to make himself understood. A model of a boat was produced, and using sticks, Nindemann showed that the ship had masts and yards, and that it was a steamer. He then made models of the ship's boats. Obtaining two pieces of ice, he showed how the ship had been crushed. He next put in each little boat so many sticks to represent the men in each boat. He then showed a chart of the ocean and coast-line, and tried to explain how the boats were separated in a gale. He showed the way they had walked along the river, and by putting his head down and closing his eyes he tried to explain how many days the rest of the party had been left. Sometimes they seemed to be able to follow him, but no assistance was offered.

Next day an incessant but fruitless attempt to make themselves understood was made. On the 27th October, Nindemann could contain himself no longer, and broke into sobs and groans. A woman in the hut took pity on him, and began talking earnestly to one of the men, who came to Nindemann and said something about a commandant. Late in the evening, a tall Russian, whom Nindemann took to be the commandant, arrived, but he understood neither English nor German. He evidently, however, knew something of affairs, for he uttered two words, "Jeannette," "Americansk." Noros, meanwhile, was in the hut writing out an explanatory note which Nindemann and he had composed, and the Russian picked this up and put it in his pocket, and refused to return it.

On the morning of the 28th they were taken charge of by a man who was to take them to Bulun, where they arrived on the 29th October. Here they saw the commandant, who turned out to be a different individual from the one previously seen. He seemed to understand Nindemann's signs and pantomimes, and spoke of telegraphing. Nindemann made signs for pen, ink, and paper, and dictated to Noros a dispatch to the American Minister at St. Petersburg. This was taken by the commandant, who said he would leave with it next morning.

A hut was assigned to them, and on the 2nd November, three days after the commandant had gone off with their dispatch, they were electrified by the arrival of Melville.

We must now leave Nindemann and Noros, and return to Melville's party in the whale-boat. It consisted of Melville, Danenhower, Newcomb, Cole, Leach, Wilson, Bartlett, Lauterbach, Tong Sing, Aneguin, and Manson.

On the night of the 12th September, Melville lost sight of the other two boats, and contrived to ride out the gale. He then ran all night of the 13th, to the west and south-west. On the morning of the 14th the boat grounded in 2 feet of water, and there was no land in sight. By running some distance to the east, deeper water was obtained, but it was not until the morning of the 16th that land was sighted, consisting of two low headlands forming the mouth of a large river. They ascended the river and tried to effect a landing, but the shoals constantly prevented it. Towards night a hut was seen, and they succeeded in making a landing near it. The boat was hauled up, and a fire was kindled. The men were scarcely able to walk. During four days of their rough passage they had no water to drink, and their legs were terribly cramped. After working up the river two more days, they came to a collection of huts

where they met three natives, and feasted on venison, goose, and fish. They endeavoured to get the natives to pilot them to Bulun, but failed. Next day they pushed on, but were forced to return to the huts. The head-man of the village had, in the meantime, arrived, and Melville induced him to agree to pilot the party to Bulun. They started on the 22nd September, and on the 26th reached a village where he was informed that it was a journey of sixteen days to Bulun. Melville insisted on being taken there, and an attempt was made; but after struggling with the ice and against the wind, they had to return to the village. They were given a hut and an allowance of provisions. Melville prepared a telegram to the Secretary of the Navy and to the American Minister at St. Petersburg, and letters were written in several languages. The head-man of the village undertook to send these forward.

About the 10th October there came to the village a Russian exile, who seemed more intelligent than the others. This was the man who later fell in with Nindemann and Noros, and who was first mistaken for the commandant. He arranged with Melville to go to Bulun and bring reindeer teams for the transportation of the party, as well as food and clothing. He returned on the 29th October, when Melville had almost given him up, and he brought the note from Nindemann and Noros. As soon as Melville heard that De Long and his party were in need of assistance, he started by dog-team for Bulun, which he reached on the 2nd November, as already related.

Melville now arranged for Danenhower to take charge of the party while he started north in search of De Long. He was absent twenty-three days, and during that time he travelled 663 miles, but although he recovered the log-books and other articles cached, and found several of

the records left in the huts, he failed to find the bodies. Winter had now set in severely, and the search had to be given up.

No news had yet been heard of Chipp's party, and it may here be mentioned that no trace of them was ever found. It is probable that the boat went down in the gale.

Early in the year of 1882, Melville began preparations to renew the search in the spring. He received instructions from the American Government to spare no expense. Food and clothing were transported from Yakutsk to the Lena Delta, a distance of over 1500 miles. Melville had Nindemann and Bartlett to assist him when he started for his second search on the 16th March. On the 23rd March the bodies were found. De Long, Dr. Ambler, and Ah Sam, the three who lived longest, were found lying together.

Melville ascertained that the whole of this district, at certain seasons of the year, was under water, and he therefore had the bodies removed some distance to the south, where he had them buried on a rock about 300 or 400 feet high.

A long search was now made for Chipp and his party, but, as already mentioned, no trace of them was found.

During 1883 the American Government appropriated the sum of 25,000 dollars for the purpose of having the bodies conveyed from the Lena Delta to America and for a further search to be made for the missing boat. This was carried out by Lieutenant Harber, of the U.S.N.

The fate of this expedition was one of the saddest in the history of Arctic exploration. It achieved little in the way of discovery, but yet, as will be hereafter explained, the loss of the *Jeannette* had an important bearing on a future expedition which was destined to add greatly to our knowledge of the Arctic regions.

CHAPTER IX

GREELY'S EXPEDITION (1881–84)

Lieutenant Weyprecht, of the Austro-Hungarian Expedition, at the meeting of the German Scientific and Medical Association, at Gratz, in September 1875, presented a plea for systematic Polar exploration and research.

A Commission, appointed by Prince Bismarck to consider the question, strongly commended the plan to the Bundesrath and to all interested nations.

The Turko-Russian War delayed the question until 1879, when an International Polar Conference met at Hamburg in October. At this Conference twelve stations were agreed upon, one of which was to be in the Archipelago of North America.

The United States did not at first take any action in the matter, but ultimately they decided that the Signal Service should form a Polar station at Lady Franklin Bay, and carry out the programme outlined by the Hamburg Polar Conference.

A sum of 25,000 dollars was appropriated for the expedition, and Lieutenant Greely was appointed to the command. He was instructed to establish the station near Lady Franklin Bay and contiguous to the coal-seam discovered by the English Expedition of 1875. The steamer on arrival at the station was to discharge her cargo and then return to St. John's, Newfoundland.

CHART OF GREENLAND AND ELLESMERE ISLAND.

Lieutenant Greely was also instructed that it was contemplated that the station would be visited in 1882 and in 1883 by a steamer, sailing, or other vessel, by which supplies as would be deemed needful would be sent. In case the vessel was unable to reach the station in 1882, she was to cache a portion of her supplies at the most northerly point attained on the east coast of Grinnell Land. In case no vessel reached the station in 1882, the vessel sent in 1883 was to remain in Smith Sound until there was danger of its closing by ice, and, on leaving, was to land all her supplies and a party at Littleton Island. This party was to be prepared for a winter's stay, and was to be instructed to send sledge-parties up the east side of Grinnell Land to meet Greely's party.

If not visited in 1882, Lieutenant Greely was to abandon his station not later than 1st September 1883, and to retreat southward by boat, following closely the east coast of Grinnell Land until the relieving vessel was met or Littleton Island reached.

The arrangements promised in these instructions to Greely are of great importance in the light of subsequent events.

The steamer *Proteus* was selected to convey the party to Lady Franklin Bay. She was a barkentine-rigged steamer of oak with two compound engines, 110 horse-power, 467 tons register, had an iron-armed prow, and was sheathed with iron-wood from above the water-line to below the turn of the bilge. Her screw was self-lifting, she had spare rudder and propeller, and was in every respect suitable for ice-navigation. The charter of this vessel consumed over $\frac{3}{4}$ of the appropriation, leaving less than 6000 dollars for the special outfit of the party.

The master of the *Proteus*, Richard Pike, had for many

years been engaged in the seal fishery of the Labrador ice, and was one of the most experienced captains and ice-navigators of Newfoundland.

Greely's party, numbering twenty-three men in all, left St. John's, Newfoundland, on 7th July 1881. Lieutenant Kislingbury was the second in command, and Lieutenant Lockwood was third. Dr. Pavy, the surgeon of the expedition, had spent the preceding year in Greenland, and joined the party at Godhavn.

Gales and thick weather delayed the *Proteus*, and the island of Disco, at Godhavn, was not reached until the 15th July. Twelve dogs with a supply of dog-food were purchased here, and the *Proteus* again sailed on 21st July. Some more dogs with food and other supplies were obtained at Ritenbenk, and a considerable number of sea-birds were shot and hung up in the rigging to dry. At Upernavik two Eskimo were engaged: Thorlip Frederik Christiansen, aged thirty-five, and Jens Edward, aged thirty-eight.

From the Berry Islands a direct course was laid for Cape York, which was sighted on the 31st July. Melville Bay had been found almost clear of ice, and was crossed in the remarkably short period of thirty-six hours.

The Carey Islands were reached on the 1st of August, and the cairn erected by Sir George Nares in 1875, and also the dépôt of 3600 rations, were examined. On the whole, the dépôt was still in good condition.

A quantity of coal was landed on the extreme south-western point of Littleton Island, and the mail landed by Sir Allen Young for the English Expedition was discovered at the extreme northern end of the west coast.

To the northward from Littleton Island the sea was entirely free from ice, and Greely decided not to touch at Cape Sabine, but to shape a course for Cape Hawks.

The dépôt left here by the English was visited, and, with the exception of a portion of the bread, was found to be in good condition. As Greely was short of boats, he took on with him the English jolly-boat.

The cairn on Washington Irving Island was searched, and the record of Nares was taken, and a copy left with a new record giving a brief account of the expedition to date. Near Cape Frazer the first palæocrystic floeberg was seen. A cache of 200 lb. of meat and 280 lb. of bread was left at Carl Ritter Bay. Greely points out that the indentation here is so slight, and the curve so great, that it is a bight rather than a bay. The south-eastern part of Lady Franklin Bay was reached on the 4th August, but here a heavy pack was met, and it was not until the 11th that the *Proteus* entered Discovery Harbour.

On entering the harbour, eleven musk-oxen were seen. They were immediately followed, and all were shot. It was found that the *Proteus* could not safely approach Watercourse Bay, and Greely therefore decided to make his station on the shore of Discovery Harbour, near the quarters of the English Expedition.

The site for a house was soon chosen, and the unloading of the vessel was proceeded with. The station was named "Conger," after Senator Conger, who had interested himself specially in behalf of the expedition. In addition to the general supplies, 130 tons of coal were landed.

Greely records that, on the 25th August, Lieutenant Kislingbury, the second in command, spent the day on the *Proteus*, and next day, dissatisfied with the expeditionary regulations, requested that he be relieved from duty with the expedition. His request was granted, and he was ordered to report himself to the Chief Signal Officer on his return to the States. However, just as Lieutenant Kislingbury was leaving the station, the

Proteus got under way, and he was obliged to go back to Conger. He did not afterwards return to duty as an officer. Greely gives no explanation of the matter, but Lockwood in his diary states that one of the annoyances complained of by Kislingbury was the rule that officers should rise in the morning with the men.

A wooden house was constructed, 60 by 17 feet. Its walls were double, the two coverings of ½-inch boards being separated by an air-space of about a foot. The roof was only a single board thick, but was covered (like the sides) with tar-paper. The house had also a ceiling, and the space between this and the roof afforded an excellent storage-place for articles which would have been injured by exposure. The interior of the house was divided into three rooms, one 17 by 15 feet for the officers, another 8 by 17 feet served partly as the cook's kitchen and partly as an entry, and the third room was used by the men. The house was conveniently and pleasantly situated within 30 yards of the water's edge, on a small tableland between two brooks, which for a few months in the year ran into the sea. The coal-mine was 4 miles distant, and could be reached through a valley to the eastward.

The house had not been quite finished when field-work commenced. Greely expresses the view that autumn sledging should be carefully planned, attempted with great caution, and never pushed to great distances. He states that in autumn temperatures the travelling-gear of a man once wet, the chances of dangerous frost-bites and disaster increase.

On 30th August Dr. Pavy and Sergeant Rice, the photographer of the expedition, were sent north as far as practicable towards Cape Joseph Henry. They were to examine the condition of the English dépôt at Lincoln Bay, and report on the practicability of autumn and

spring travelling by sledge along the Grinnell Land coast. They travelled with packs, carrying a dog-tent, blankets, and provisions to last them as far as the English dépôt, where their supplies could be renewed.

The dépôt at Lincoln Bay was missed in going north, and the party pushed on to Cape Union before returning south. Here a channel of open water, 2 miles wide, was seen to stretch as far northward as the eye could reach. In returning, the dépôt at Lincoln Bay was discovered, and was found to be in bad order. Greely recommends that water-tight cases of very light tin should be used in protecting stores thus cached.

Sergeant Rice, who had broken through the young ice on his way north, was attacked on the way south by acute rheumatism. In spite of the severe pain, he made a determined attempt to walk to the station, but was ultimately forced to yield. The doctor made him as comfortable as possible in the tent, and proceeded to Conger for assistance. A party of men with a sledge and improvised stretcher was immediately dispatched, and after considerable difficulty Rice was conveyed to the station. He rapidly recovered, and ten days later was again in the field.

During Dr. Pavy's absence, Greely established a large supply dépôt near Cape Beechy. On 7th September, Greely visited the Bellows, a valley about 15 miles from the station. Ten eider-ducks were obtained, and nine out of fourteen musk-cattle were killed.

Dr. Pavy, with Private Whisler and Eskimo Jens, left the station on 2nd October to proceed to Cape Joseph Henry and lay out along the Grinnell Land coast such dépôts of provisions as would facilitate spring travel in that direction. A point near Mount Parry was ultimately reached, and here 150 lb. of pemmican and 50 lb. bread were cached. The open condition of the floe-ice in

Robeson Channel prevented further advance. Conger was again reached on the 9th.

On the 10th October, Lockwood established a small dépôt near Cape Baird. On the 13th September a large pack of wolves made their appearance, and for some time they were a source of danger. Greely decided to attempt to poison them, and ultimately succeeded in poisoning four. The rest then disappeared for that season.

On 17th September the first birthday occurred, and the occasion was taken to inaugurate a practice, which was afterwards adhered to at Conger, of exempting the man from duty and of allowing him to select the dinner.

The temperature fell below zero on the 20th September, which Greely believed was the earliest date on record. The first star at midnight was seen on 9th September, and so extremely rapid is the approach of darkness in all very high latitudes that on the 8th October lamps had to be used throughout the twenty-four hours, except for an hour at midday.

Scientific observations were conducted regularly and very carefully at Conger during the whole stay of the expedition. Some idea of the amount of labour involved may be conveyed by the statement that the number of observations recorded daily was as follows: Meteorological, 234; tidal, 28; magnetical, 264—aggregating 526 daily. On what were called term-days the number of magnetical observations was increased to over 1200. Pendulum, time, and sound experiments were also made.

As regards food-supply, the expedition was fortunate in being able to obtain sufficient musk-meat to enable each man to have 1 lb. daily during two years at Conger. Condensed milk, butter, and oatmeal had been taken in large quantities, and there was a liberal supply of cheese, macaroni, and condensed eggs. They had also a large amount of fruits and vegetables. Tomatoes were

found to be the best vegetable, and apples and peaches were considered the best fruits. One ounce of limejuice was issued to each man daily.

Even after the disappearance of the sun, it was decided to continue sledging work. On 23rd October, Lockwood and three men were sent to Dépôt "B," at Cape Beechy, to construct a large commodious snow-house for the use of the sledge-parties. About 4 cwt. of coal from Watercourse Mine was taken as fuel to be used in a small stove. At Dépôt "A," at Cape Murchison, about 3000 lb. of coal, also from the mine, was accumulated.

On 3rd November, Lockwood with seven men left the station to attempt to cross Robeson Channel from Cape Beechy. Next day Dr. Pavy, Lieutenant Kislingbury, Sergeant Rice, and Eskimo Jens, with two dog-sledges, left to add stores to the dépôt in Wrangel Bay. This latter party succeeded in adding a small quantity of stores to the dépôt, but Lockwood was unsuccessful in his attempt to cross Robeson Channel, owing to the open condition of the straits.

The results of these winter journeys satisfied Greely that it was not advisable to send sledge-parties to any considerable distance after the sun has left or before its return. The sun was last seen at the station on 14th October, and again reappeared on 28th February, 137 days later. Very dark nights were, however, uncommon, and except on a few cloudy and stormy days they were never prevented by darkness from taking their regular exercise.

During October a wall of ice, 6 feet high, was constructed some 3 feet from the house, and was rendered windproof by a coating of wet snow. The space between the house and the wall was later filled in with loose, dry snow, which formed an excellent protection.

As regards clothing, Greely came to the conclusion

that for ordinary use first-class woollen under-garments, with heavy woollen clothing, are all that is essential in Arctic service.

In December a number of men gave indications of being mentally affected by the continual darkness. The Eskimo were extremely depressed, and on the 13th, Jens Edward disappeared without eating his breakfast, or even taking his seal-skin mittens. A search was made, and he was discovered near Cape Murchison, travelling rapidly northward. He returned to the station without objection, and in time recovered his spirits.

The lowest temperature during the winter occurred on 3rd February 1882. The minimum was $-62{\cdot}2^{\circ}$, the maximum $-44{\cdot}1^{\circ}$ F. The protective influence of a snow-hut was shown by the fact that after a mean temperature below -50° for five consecutive days, the thermometer inside read -17°. Even in these extremely low temperatures some hunting was done. On 16th February the mercurial thermometers thawed out, after having been frozen for sixteen days.

Preparations for spring sledging were actively commenced early in February. The saddler, the tinman, the carpenters and others were kept busy with sledges, boat, cooking-lamps, sleeping-bags, foot-gear, etc.

Of twenty-seven dogs purchased in Greenland only twelve were living at the end of 1881. In addition to these twelve there were three private dogs. This allowed two teams. As regards sledges, Greely decided to use the Hudson Bay pattern for the supporting sledges on the North Greenland coast. This form of sledge is suitable for the deep snow experienced by Lieutenant Beaumont. Light strips of ash were fastened to the bottom on each side to serve as runners, and it was found necessary to shod these with steel. Greely afterwards recommended future explorers to use Hunt's pattern of the St. Michael's sledge,

with the addition of steel runners so arranged as to be attached or detached at pleasure. The Hudson Bay sledges, with lashings and coverings complete, weighed only 35 lb. The Greenland sledge was adopted as the pattern for the dog-sledge. The lashings of this sledge being of seal-skin permit rough handling without the sledge being materially injured. Its only drawback is the liability of the runners to split longitudinally through the row of holes bored to receive the lashings. Greely strengthened the upstanders and runners of his sledges by setting in plates of wrought iron. The pine slats commonly in use in Greenland were replaced by the best American ash, hickory, or oak. The weight of the sledge used was 105 lb.

The sledging ration in 1882 was 39 oz., but it was increased in 1883 to about 42 oz., consisting of 22 oz. meat, 2 of butter, 4 of vegetables, 10 of bread, 2 of sugar, $\frac{1}{2}$ oz. of milk, 1 oz. of tea and chocolate, salt $\frac{1}{4}$ and pepper $\frac{1}{20}$ of an oz. The meat consisted of pemmican, bacon, musk-meat, canned sausage, and corned beef. Limejuice pemmican was found to be very unpalatable, and was only eaten under press of hunger. Greely's parties generally complained that chocolate taken in the field made them thirsty. No rum was ever sent as a sledge-ration, but it was furnished as medicine to be used under extraordinary occasions at the discretion of the officer in charge. The alcohol allowance of fuel for a party of three or four, at first 5 oz., was increased to 6 oz., as being the smallest amount on which the food could be cooked. As the result of his experience, Greely recommended that the vegetable-ration should be 3 oz. preserved potatoes, and that the other ounce should be replaced by half an ounce each of milk and of extract of beef. Of the meat, only half should be of pemmican, the balance to be divided between bacon and fresh meat; the latter to be sliced fine and frozen. In case fresh

meat cannot be obtained, Greely recommended that of the 11 oz. meat, 4 oz. should consist of bacon and the balance of sausage and canned fresh meat. The limejuice was frozen into small squares, each of which represented a ration. It thaws at a temperature of 14° F.

Greely recommends alcohol of great strength for fuel in the field, and that it should be carried in tightly sealed vessels of about 2 gallons. This enables caches to be frequently made for the return journey. The lamp and all the cooking vessels were fireproof, made as far as practicable of single pieces of heavy tin without solder. A lamp with five wicks was used, and at a temperature of −20° melted enough snow in sixteen minutes to produce 2½ quarts of water, and in ten minutes more, raised it to the boiling-point. At the same time, in an open vessel, there was melted 1½ quart of water. The amount of alcohol expended was 4 oz.

On 19th February 1882, Lieutenant Lockwood with two men and a dog-sledge left the station to visit Dépôt "B," near Cape Beechy, and to examine the ice in Robeson Channel with a view of selecting the best route to be followed in a later trip to Thank-God Harbour. The party returned on the 22nd, having found the ice favourable.

On the 1st March, Lockwood with three men set out for Thank-God Harbour. Other two men with a second dog-team were to support him as far as possible. The distance of 28 miles to Dépôt "B" was travelled in five hours and twenty minutes. The night was spent in the snow-house there, and next day the whole party set out across Robeson Channel. When the bad ice near the shore had been crossed, the supporting sledge-party returned. Lockwood reached the Greenland coast the same day as he left Cape Beechy. On the 3rd March he travelled south along the coast, and arrived at the

observatory above Thank-God Harbour, occupied by Bessels and Bryan in 1871–72. The sides and one end of this building were still standing. Six 45 lb. cans of pemmican, 35 lb. of farina, a half-barrel of limejuice, a barrel of yellow corn-meal, and 10 barrels of hard bread were found in the building, in fairly good condition. There were also hatchets, saws, shovels, lead, shot, gunpowder, and cartridges for rifle and pistol.

On the 5th March, Lockwood proceeded to Cape Sumner over the route followed by Captain Hall in 1870. During the whole of this day the temperature remained below $-50°$, and the party were compelled to continually keep the warm hand to the face in order to prevent it from freezing. At night a deep snow-drift was found in a small ravine, and a hole was dug in this and a house formed by using the tent and poles for a roof. Next day Newman Bay was reached in a snowstorm, and shelter had to be taken in a house made in a snow-bank, where they had to remain until the morning of the 9th. Here they had an experience they were not likely to forget. Lockwood and Jewell had used up or had lost their stock of matches. Brainard had some, but they seemed damp and would not light. They were 60 miles from the station, and there was a temperature of freezing mercury outside. Without fire they could not obtain water, and without water they could not live long. The matches were tried again and again, but only gave a flicker and went out. At last Jewell produced a love-letter which had been carefully kept in an inside garment, and holding a piece to the next match it caught the flame, and with this the alcohol-lamp was at once lighted. The cause of the matches not lighting eventually proved to be the vitiated, damp atmosphere of the hut.

Eight hours' travelling on the 9th brought the party to Boat Camp, where the canvas and whale-boats were

found in very much the same condition described by the English. From this camp, Cape Sumner was reached in an hour and a half, and the tent pitched. Here Lockwood decided to leave the tent, sleeping-bag, and some other articles of use for further exploration, and to return to Conger. The party started on the 10th in a temperature of $-41°$, and crossed Robeson Channel to Dépôt "B" in $12\frac{1}{2}$ hours.

On 5th March, Dr. Pavy, with two men and a dog-sledge, was sent to convey a sledge-load of provisions to as northerly a point on the Greenland coast as could be reached in one day's march from Cape Beechy. They reached the Greenland coast, and cached the supplies at a point called the "Gap." They returned to Conger on the 9th.

On the 13th March, Sergeant Brainard, with seven men, was ordered to take a small boat with such additional supplies as could be hauled, to the dépôt near Cape Sumner. The party left the snow-house near Cape Beechy on 15th March, in a temperature of $-50{\cdot}5°$. The Greenland coast was reached on the 17th, after very severe labour. On the way one man had to be sent back to Dépôt "B." Brainard reported that he placed the boat beside a huge rock, and fastened her down securely with boxes, rocks, etc., first placing hard bread, medical knapsack, etc., under her, to prevent them from being blown away. The channel was then recrossed, and Dépôt "B" reached on the 19th, and Conger on the 20th March.

On 19th March, Dr. Pavy, Sergeant Rice, and Eskimo Jens, with a dog-team, were sent north in an attempt to reach land to the northward of Cape Joseph Henry. Greely states that Pavy was confident that land would eventually be discovered in that direction. Sergeant Jewell and Eskimo Christiansen were detached as a

supporting party as far as Lincoln Bay. Dr. Pavy on reaching the dépôt previously formed by him near Mount Parry found that a bear had eaten 70 lb. of the pemmican.

At Cape Union the party were storm-stayed for twenty-two hours. Two trips had to be made back to Lincoln Bay to bring north supplies. On the 31st March they left Lincoln Bay with the last load, but when near Cape Union the right runner of the sledge broke longitudinally through the lashing-holes. Rice offered to return to Conger for a new runner, and started at once with Eskimo Jens. They made the journey to Dépôt "B" in one march, but the Eskimo was completely exhausted.

The sledge having been repaired, the party finally left Lincoln Bay on the 6th April, and reached the *Alert's* winter quarters on the 11th. Beneath the large stone that covers the grave of Petersen they found that a hare had taken up its residence. The signal flag-staff, with attached halliards, at Cape Sheridan, was still standing in as firm a condition as when erected in 1875.

Instead of crossing the Feilden Peninsula, Dr. Pavy decided, on account of the bare ground in some places, to follow the coast to Cape Joseph Henry. This decision, though it seemed wise at the time, probably proved fatal to the success of the journey. During the 18th and 19th April a severe storm confined them to their tent. During the 20th and 21st they succeeded in transporting their stores to a point on the polar pack about 4 miles north of Cape Joseph Henry. On the 21st another storm was experienced, which continued as a severe gale during the night. On advancing north on the 23rd, Jens suddenly announced the presence of water. This was found to be an open channel a mile wide, which had probably been caused by the gale. The ice on which

the party was seemed to be in motion, and Dr. Pavy therefore decided to return to Cape Joseph Henry. On arriving opposite the cape, open water of three-quarters of a mile in extent was found between the ice and the land. Ultimately the ice closed in against the shore and allowed the party to retreat in haste, abandoning their tent, some provisions, and part of the scientific instruments. Dr. Pavy, under the impression that Robeson Channel was open, decided to return in haste to Conger, in case his retreat might be cut off. The station was reached on the 2nd of May.

On the 26th April, Greely with three men started for the interior of Grinnell Land. They entered Conybeare Bay, and discovered that it was a large fiord, which was named "Chandler Fiord." On reaching the head of this they passed along the bed of a river, and at certain places could hear the water running under the ice. Ultimately they came to a point where the river was open, and they were forced to take to the hillside. A short distance farther a surprise awaited them in the form of an immense ice-bound lake, which was named "Lake Hazen." The station at Conger was again reached on 7th May.

The most important sledge-journey undertaken by the expedition began on the 3rd of April, under the command of Lieutenant Lockwood. Its object was the exploration of the North Greenland coast. The advance sledge was to be hauled by dogs, with Eskimo Christiansen as driver, and Lockwood was to select one man from the supporting party before their return. This latter party consisted of twelve men, with four sledges of the Hudson Bay pattern.

The average amount of extra clothing was 10 lb. per man. The clothing worn was generally double suits of underclothing, three pairs of socks, with outer ordinary

wool clothing, over which a light duck suit was worn, to keep the snow from adhering to the wool. A few only wore outer clothing of skin. The foot-gear consisted of moccasins, and Greenland, Labrador, and canvas boots.

The party left Dépôt "B" to cross Robeson Channel on the evening of 5th April. The load was equal to 130 lb. to each man, and 100 lb. to each of the dogs. Next day one man suffering from rheumatism was ordered to return to the station; and later another man who had frozen one of his toes was taken back to Cape Beechy by Lockwood. On the 7th the party experienced a violent gale, which confined them to their sleeping-bags forty-five hours.

On reaching Polaris Boat Camp, one of the Hudson Bay sledges had been so injured by the rough ice that it was practically useless. At this camp the wind again became very violent, blew down the tent, and one gust lifted the dog-sledge, with its load of 200 lb., bodily from the ground. The sledge struck one man, knocking him several yards and injuring him severely. Other two men, owing to illness, had to be sent back from this camp.

The party were employed until the 16th April in accumulating at Boat Camp the stores from the other dépôts, and while this was being done Lockwood returned to Conger for an extra set of runners, as he was afraid that the runners of the dog-sledge might break down.

The party started from Boat Camp with 300 rations on 16th April. The eight dogs hauled about 800 lb., and each man hauled about 217 lb. on the second sledge. On the third and fourth sledges the men dragged about 150 lb. each. The constant weights of the dog-sledge were 243 lb., and of the remaining sledges 375 lb.

During the first six days they had to travel over land, and after tremendous exertions the sea-coast was again

reached on 22nd April. The party arrived at Cape Bryant on 27th April. On this journey one of Beaumont's caches was discovered, and the rations found were taken on to Cape Bryant.

At this point the supporting party were sent back, and Lockwood, Brainard, and Christiansen, with rations for twenty-five days, set out on 29th April towards their farthest north. The weight carried amounted to about 783 lb., and consisted of rations 227 lb., dog-pemmican 300 lb., equipments 176 lb., and dog-sledge 80 lb.

A course across the fiord towards Cape May was taken, and the weather was delightful. Sixteen miles were covered in eight hours. Next day the snow was soft and deep, like that experienced by Beaumont, and it was found necessary to advance with half-load and then return for the other. Lockwood now gave up the idea of visiting Cape May, and directed his course towards Cape Britannia. After this hard work Lockwood and Brainard could not sleep well, but the Eskimo invariably snored two minutes after composing himself to rest. On the 2nd May they came to a crack in the ice, and had to follow it several hundred yards before they could cross it. Thinking this would be a good chance to get a deep-sea sounding, Lockwood ran out all the line he had, but did not reach bottom. He then attached coils of seal-thongs, then some rope, and finally the dog-whip, but still did not reach bottom at 820 feet. After hesitating whether he would also use the dog-traces, they began to pull up the line, and had drawn out the whip, when the rope broke, and everything below was lost. All further attempts at sounding were thus prevented.

Cape Britannia was reached on 4th May. This was the *Ultima Thule* of Beaumont's hopes, and quite as far as Greely expected Lockwood to reach. A cairn was built, and in it was deposited a record, five days' rations,

three days' dog-food, the extra sledge-runner, shelter-tent, little lamp, and the snow-shoes. Lockwood and Brainard ascended to the top of the cape, 1950 feet high, where a cairn was built and a record deposited. The latitude was found to be 82° 44′.

Rounding Cape Frederick next day, they camped opposite Nordenskjöld Inlet. A tidal-crack was here again met with. On the 6th May, Mascart Inlet was reached, after a ten hours' march which exhausted both men and dogs. Numerous signs of animal-life were seen here; a hare was captured, and traces of foxes, lemmings, bears, and musk-oxen were observed.

On the 7th May, Low Point was reached. The latitude of this place is the same as Cape Columbia, the most northern point of Grinnell Land. On the 10th May, De Long Fiord was crossed, and cairns constructed on the northern and southern points. The party camped on Mary Murray Island, in latitude 83° 19′, and were here delayed 63½ hours by a violent gale. A lemming was captured by the dogs at this camp.

Lockwood Island was reached on the 13th of May, and England's record was at last broken. The honours of the farthest north had been held by England for three centuries. The highest latitude reached by Lockwood was 83° 24′, against Markham's 83° 20′ 26″.

From the summit of the island, which was ascended by Lockwood and Brainard, could be seen a rocky headland, Cape Kane, to the north, and still some distance beyond, another, Cape Washington. On Lockwood Island numerous traces of foxes, lemmings, hares, and ptarmigan were seen. On the summit, Lockwood left a record in a small tin box under a few small stones, as no large ones could be found.

The return journey was commenced on the evening of the 16th May, and Cape Bryant was reached in nine marches.

After leaving Cape Britannia, where they again obtained the snow-shoes, deep snow was met, and Lockwood and Brainard used the shoes for the first time, and found immense relief. Both bitterly regretted they had not used them going north.

From Cape Bryant to Polaris Boat Camp was passed over in six marches. Here three of the supporting party awaited their return. From this camp the whole party crossed Robeson Channel to Cape Beechy in fourteen hours in face of a violent snowstorm. Conger was reached on 1st June, after an absence of sixty days.

The mean temperature during the outward part of this journey was below zero. The distance of 276 miles entailed travel of 470 miles. Lockwood personally during the sixty days covered 1070 miles in forty-six marches. His discoveries extended 95 miles along the North Greenland coast beyond the farthest point seen by Beaumont.

The winter at Conger had been of great severity, the mean temperature for the 131 days without the sun being −32·3°.

On 19th May 1882, Greely visited the coal-mine. He found the seam 200 yards long and extending 8 feet above the level of the creek. An immense quantity of coal could be easily mined.

On 24th June, Greely with four men left for the interior of Grinnell Land, through Black Rock Vale. A two-wheeled wagon was used to carry the provisions, etc. This valley was entirely barren of snow, and in most places was covered with a comparatively luxuriant vegetation. Grasses or sedges 10 or 12 inches in height were frequently noticed on the banks of a river. The temperature during the journey remained extremely high. On one occasion the thermometer reached 74° F. in the shade, and as many as fifty butterflies were seen in one day!

Beyond this valley, a system of small lakes, draining

from one into another, was found to finally discharge into Lake Hazen. Numerous birds and herds of musk-oxen were met with. Traces of Eskimo were discovered in many places both in the form of summer encampments and permanent winter huts. These must have been inhabited within a comparatively recent period. From the various relics found, Greely formed the opinion that these Eskimo had dogs, sledges, arrows, and skinning-knives, and that they fed on musk-oxen, seals, hares, and occasionally fish.

After travelling over 100 miles from Conger, the wagon broke down completely, and had to be abandoned. The remainder of the journey was made with knapsacks. Skirting the south shore of Lake Hazen until its termination was reached, they ascended a river which entered the lake. One of the men became exhausted carrying a heavy load, and had to be sent back. Near the source of the river Greely ascended a mountain with great difficulty. The height was ascertained to be 4500 feet above sea-level, and Greely believed it to be the highest mountain in Grinnell Land. He named it "Mount Arthur." It is the crest of the land, and the farther side drains to the western sea.

They now started on their return journey, and reached Conger on 10th July. The journey entailed an aggregate of 352 miles' travel in nineteen marches—an average of $17\frac{1}{2}$ miles, which was a remarkably good performance over rough country.

A ship was anxiously expected in either July or August, but these months passed without it making an appearance.

The first serious breach of discipline took place on 28th August. The engineer having stolen some of the fuel-alcohol, was found drunk. About the beginning of October a bear visited Conger on several occasions, and Greely thought it necessary to require the men to obtain

authority for any extended absence from the station. In connection with this order, Sergeant Lynn was reduced to the ranks for having made a "disrespectful remark."

From 14th to 19th November there was a great magnetic storm, which was general throughout the world. During this time the auroral displays were magnificent, and on the 17th the magnetic needle ranged in variation considerably over 19°.

The second winter passed, and left the party in much better health and spirits than had been anticipated. There had been an abundance of fresh meat, and no scurvy made its appearance.

The spring work of 1883 was to be a renewal of explorations in North Greenland. Lockwood left Conger for his preliminary journey on 10th March, with five men and dog-teams. During an absence of seven days he accumulated about 1300 lb. of field-supplies near Cape Sumner.

He started on his final journey northwards on 27th March. He was instructed to return to Polaris Boat Camp not later than 31st May. The party left thoroughly equipped, and had the former year's experience in their favour. The journey to Black Horn Cliffs from Conger was made in six days, against twenty-two days in 1882. Here, however, open water was met, and the party had to return. They reached Conger on the 12th of April.

In discussing this journey, Greely expresses his belief in an open Polar Sea which could only be entered by a ship in extremely favourable years by the Spitzbergen route. The huge floebergs of the north are given off by glacial lands in the vicinity of the North Pole, according to Greely's view. The discoveries of Nansen prove the non-existence of an open Polar Sea, and Peary claims to have discovered that the source of the floebergs is in the glaciers of the extreme north of Greenland.

On the 25th of April, Lockwood with Brainard and Christiansen left Conger to attempt to cross Grinnell Land to the western ocean. They had a team of the best ten dogs, and provisions to last thirty-one days. A supporting sledge was to accompany them for two marches. Lockwood's fourth camp was situated about 67 miles from Conger. Lieutenant Archer in 1876, with an eight-man sledge, took fourteen days to do the same distance. This illustrates the great difference between sledging with dogs and with men.

From Archer Fiord, Lockwood passed along the Ella Valley to the base of a glacier 150 feet above the sea. The glacier stretched from side to side of the valley, and was found impassable. Lockwood next decided to try the route *via* Beatrix Bay. From the head of this bay they passed along a valley to its termination, and then had to turn off to the north up a steep rocky ravine. Here the large sledge had to be left, and a small one brought specially for land-travelling was afterwards used. From this camp they started for Musk-ox Valley on 8th May. The following day's march carried them to the apparent end of the valley, and they then entered a cañon which seemed to end in a glacier 8 or 10 ten miles distant; but as no other route seemed possible it was followed. This cañon took them into a broad valley with a lake in its centre. The wall of a glacier apparently rose all along the south side of the valley, and the country behind seemed one continuous glacial surface. Travelling in a south-west direction, they found the ice-capped land presented to their view a vertical face of solid ice from 125 feet to 200 feet in height. This wall of ice ran across the country in such a manner that Lockwood named it "The Chinese Wall Glacier," but later it was designated Mer de Glace Agassiz. The next march brought them to the watershed of Grinnell Land. They now descended a

narrow gorge bounded on either side by towering mountains, and finally reached a narrow valley 1000 feet lower down. Passing along this valley, and still rapidly descending, they reached the head of a fiord where the water was salt. This was named "Greely Fiord." Proceeding about 26 miles down the fiord, they reached their farthest on 13th May, and camped in a heavy snowstorm. By fasting nineteen hours, they were enabled to remain here until the storm abated.

The return journey had to be made on short rations. This party travelled 437 miles during their month's absence.

The work of exploration was now practically completed, and preparations for the contingency of a retreat southward began to receive serious attention. Greely had already established a large dépôt of provisions at Cape Baird, on the south side of Archer Fiord, and 12 miles from Conger. This work was begun as early as the 1st February. Dr. Pavy protested against the work as entailing unnecessary exposure, and some warm words evidently passed between the doctor and Greely. The latter makes the charge that this was the first of a series by which Dr. Pavy opposed all the work initiated during 1883. The doctor's objection was no doubt to the work being done during the coldest month of the year. Greely takes great credit for establishing this dépôt 12 miles from the station, but it is only just to the doctor to state that Lockwood in his diary mentions the fact that as early as March 1883 Dr. Pavy and two others of the party were in favour of abandoning all further explorations, and applying their efforts to depositing provisions down the straits to secure their safe retreat in boats in August and September. No mention of this fact is made by Greely. He states that the correspondence between them formed part of his official report, but has no place in his book.

Lockwood also states that, on his return from his North Greenland journey of 1883, Lieutenant Kislingbury's only thought seemed to be that a sledge-party should be sent down to Littleton Island to have the ship leave her supplies at Cape Sabine instead of at the island, and that in expressing this view Kislingbury merely reflected the latest opinion of the doctor.

The reader may be left to judge what effect it would have had on the ultimate fate of the party had these ideas been carried out.

In order further to insure a safe retreat, Greely decided to bring from Thank-God Harbour the English ice-boat left there by Beaumont in 1876. This boat was brought across the channel by twelve men, who made the trip of 90 miles in six days in a mean temperature of $-21°$.

On 1st June, Greely being dissatisfied with the manner in which Dr. Pavy had kept the specimens of natural history and the notes concerning them, transferred the work to Lockwood. On the 19th July the bitter feeling between Greely and Dr. Pavy was aggravated by the latter declining to renew his contract, which expired on the 20th July, and refusing to give up his diary. As Dr. Pavy insisted that he was out of service and refused to obey orders, Greely thought it necessary to place him under arrest, with permission to take such exercise as was necessary within a mile of the station.

All preparations for the retreat having been completed by 29th July, an order was issued announcing that Conger would be deserted on 8th August if no vessel should arrive. All private property was to be left behind, except 8 lb. of baggage for each man and 16 lb. for each officer.

The station was abandoned on 9th August, the weather conditions on the 8th not being favourable. The dogs were left behind, and several barrels of seal-blubber, pork,

beef, and bread were opened, so that they might maintain life for several months in case the party might be compelled to return to Conger. Three tons of coal remained, and a sufficient quantity of provisions to have supplied scant army rations for one year, with the exception of flour, sugar, vegetables, milk, and butter. The entire collection of natural history specimens and the original records of the expedition were left at Conger.

Cape Baird was reached on 10th August. Here the caches were taken up, and then the launch, with three boats in tow, was steered down Kennedy Channel. The whole party of twenty-five were then in good health, and little could they dream of the horrors they were to undergo.

On the 12th August, Sergeant Cross, the engineer, was found to be under the influence of liquor. He had allowed the launch to ground on the falling tide. On this date Carl Ritter Bay was reached, and the cache made by Greely on his way north was taken up. On the 13th their progress was arrested by an enormous floeberg, 60 feet in height above the water, which had grounded 1 mile from the shore, and between it and the shore was an unbroken floe. A later examination of the floeberg discovered that it had split and formed a narrow cleft about 12 feet wide and over 100 yards long. Into this narrow passage, with walls of ice about 60 feet high on either side, the boats were steered, and the dangerous run was made without accident.

On the 15th August, Cross was again intoxicated, and Greely found it necessary to put Private Frederick permanently in charge of the engine. On the 21st August the boats were caught between the moving pack and an ice-foot 10 feet high, and rather severely nipped. The English cache at Cape Collinson, consisting of 240 rations of meat, salt, pepper, onion-powder and fuel, and 120 rations of bread, was taken up on 22nd August.

Cape Hawks was reached on 26th August. Here it was found that the record left on the northward journey had been untouched. This proved that no vessel had reached this point either in 1882 or 1883, and Greely began to see that the position of his party was critical. He calculated that on this date he had still sixty days' provisions, except sugar. The English dépôt left here was also found. The bread was very mouldy, but all that was eatable was taken, and the barrels were broken up for steaming purposes.

Cape Hawks was left on the afternoon of 26th August, and on the same day they became beset. The temperature was now low, and young ice formed rapidly. The Eskimo killed a seal on 1st September, and another on the 2nd.

On 3rd September, Greely took the wise course of calling together the officers and two of the sergeants and pointing out to them the necessity of hearty and united action. He expressed a desire for the frankest opinion of each one as to what would be the wisest measures to take. Various opinions were expressed, but Greely decided to make no immediate movement.

Meanwhile they slowly drifted southwards. A tepee after the Indian style was made of the sails, and could accommodate eighteen men. The ice-boat with a canvas shelter could hold nine. On 6th September they were only 3 miles from Bache Island, and about 17 from Cape Sabine. On the 10th September the launch was abandoned, and a start was made for the land with two boats dragged on sledges. On the 12th one of the two boats had to be left, as it was feared that it would break down the sledge. On this date the last of the sugar was used. A high south-west wind sprang up on the 14th, and in three hours drove the party farther north than they had travelled south in three days. This gave rise to much

disappointment, and Greely's troubles were aggravated by the criticisms of Dr. Pavy. On the 15th the latitude was found to be 1 mile farther north than where the launch was abandoned. On the 16th they were directly north of Littleton Island, at a distance of 30 miles from Cairn Point, Greenland, and 19 miles from Cape Sabine. Greely now held the view that the next start should be for the Greenland coast, and although he received little support from the officers, he was prepared to avail himself of any chance of moving in that direction. Unfortunately, next day it was found that they had drifted 3 miles to the west, and this changed Greely's intention of attempting to reach the Greenland coast. On the 18th land seemed comparatively near, but on the 19th a south-west gale sprang up, and they were drifted far to the east again. Greely now held a conference with the officers and two of the sergeants, and expressed the opinion that everything but 2000 lb. selected baggage should be abandoned, and with twenty days' rations the party should start across the pack for the Greenland shore, about 23 miles distant. The sergeants were inclined to favour Greely's plan, but the others recommended delay. Greely decided to wait till next day, but fog prevented any move being made. The drift later set again to the west, and on the 25th they were within 3 miles of Brevoort Island. On the 26th a gale caused the floe, on which the party were, to break up, and it was with great difficulty that they escaped destruction. Land to the south of Cape Sabine was at last reached on 29th September. The retreat from Conger involved over 400 miles' travel by boats, and fully 100 with sledge and boat. The condition of the party during the drift had been wretched in the extreme. In spite of all difficulties, however, the party reached land in fairly good health and with undiminished numbers.

On the 1st October, Rice and Jens started for Cape Sabine, taking with them a record to deposit in the cache. They returned on the 9th October, and brought momentous news. Three caches were found at the cape, and in one of them a record brought back by Rice explained that the relief steamer had been wrecked and sunk on the 23rd July 1883; that a dépôt of some of the provisions had been made at Cape Sabine, and that a second steamer was on her way to Littleton Island. Lieutenant Garlington, who wrote this record, also stated that he was leaving for the eastern shore, and that everything within the power of man would be done to rescue Greely's party.

On the strength of this record, Greely decided to proceed to Cape Sabine and await the promised help. The whale-boat abandoned on the ice was found by Rice at Payer Harbour safe and whole. On the 11th October, Rice started for Cape Isabella to ascertain whether the second relief ship had left supplies there. Cross, on this day, again managed to get under the influence of liquor. Next day the whole party left their temporary shelter to proceed to Cape Sabine, so as to avoid having to bring the supplies from that point. The cache left by the wrecked party was reached on the 15th, and Greely decided to take up quarters near it. On the cache being examined, it was found that instead of 500 rations (as mentioned in Garlington's record) there were scarcely 100. In this record the statement was also made that a boat had been left at Cape Isabella. On the 15th, Rice returned and stated that no boat could be found, and that only 144 lb. English meat was cached there. On the 17th the temperature was 6° below zero, and the party had practically no shelter. It was decided to build a stone house 25 feet by 18. Owing to the scarcity of rocks, the walls were made only 3 feet high, and a boat was placed on the top to form a roof. When sitting in

their bags the heads of the tall men touched the roof. Under the boat was the only place where a man could get on his knees and hold his head erect. In this miserable dwelling the winter had to be passed on starvation rations. Holes were cut in the sides of the boat, in which oars were inserted, which reaching to the side walls and fastened by ropes, supported the canvas and overlying blocks of snow which formed part of the roof. The house was surrounded with snow, and at one end a snow-house was built for the stores. Sand was put on the floor over the uneven rocks.

The provisions from the various caches were slowly brought to the house under great difficulties. The records of the expedition and the pendulum were cached on Stalknecht Island in a prominent position, so that no one visiting Payer Harbour could miss seeing it. A record similar to the one placed on Brevoort Island was put in the sextant-box and left in the cache.

On 29th October the party decided that one of two mattresses should be set aside for Greely, who directed that the other should be disposed of by lot. Greely also generously turned over his own mattress to Sergeant Gardiner, who was ill. A considerable part of the dog-biscuits was found mouldy, but although Greely gave orders that the bad ones should be thrown away, the whole were afterwards eaten by the famished men.

On 1st November the daily ration was cut down to about 6 oz. bread, 4 oz. meat, and 4 oz. vegetables, etc.; a total of about 14 oz. On this ration it was calculated that the party could be provided for until 1st March 1884, at which date there would be ten days' rations of 20 oz. each in which to cross Smith Sound by sledge.

On 2nd November, Rice, Frederick, Elison, and Lynn left for Cape Isabella to obtain the English meat cached there. The Arctic night had commenced a week before

this date, and the moon had chiefly to be depended on for light. Cape Isabella was reached on the 7th November. The first march of fourteen hours on the return journey was a very exhausting one, and had to be done on a cup of tea and no food. During this march Elison froze both his hands and feet. Frederick and Rice lay on either side of Elison, and tried in many ways to impart heat to his frosted limbs. Next day Frederick had to support and half carry Elison. On the 9th, in order to save Elison, it became necessary to abandon the meat. On the 10th, Rice started for the camp at Cape Sabine to obtain assistance. He had to travel 25 miles almost in total darkness, and he accomplished the distance in sixteen hours.

During this time, and until assistance arrived, Frederick and Lynn tried to keep Elison warm, but in a few hours the sleeping-bag became frozen so hard that they could not turn over, and had to lie in one position eighteen hours.

Elison's feet and hands were frozen solid, and his face was little better, yet he arrived at Cape Sabine alive, although in a very critical condition. The rescue party, enfeebled through want of food, made a journey of nearly 40 miles in forty-four hours, over very rough and heavy ice, exposed to temperatures ranging from 19° to 34° below zero, and almost in darkness. Sad to relate, this party of rescuers and rescued, with the exception of two, all afterwards perished.

On the 4th November it was found that some one had been tampering with the stores. On the 9th, Lockwood discovered an opened but full can of milk hidden away. About the middle of November, Greely began to give lectures, so as to interest the men and kill time. On 4th December, Greely states that he heard Dr. Pavy taking bread from Elison's bread-can, but did not charge him with it. A considerable number of foxes were killed during December, and allowed a slightly increased ration.

For Christmas an attempt had been made to save some provisions, although the whole party were starving. Breakfast on that day consisted of a thin pea-soup, with seal-blubber and a small quantity of preserved potatoes. The dinner was a more elaborate affair, and included seal-stew, potatoes, bread, pickled onions, and a kind of rice pudding. At night everybody was required to sing a song or tell a story, and the proceedings continued till midnight. The only extra rations for New Year's Day were cloudberries and a quarter of a lemon and gill of rum to each man.

On the 2nd January 1884, Elison's right foot separated from the ankle when the doctor severed a fragment of skin. The patient was quite unconscious of the fact. Later he lost the other foot and both hands in the same manner, and for long afterwards he still believed he possessed them.

On the 4th January it was found that a hole had been cut through the canvas roof of the storehouse and a piece of bacon fished out. On the 7th some one made a hole with an axe in one of the barrels of bread and stole several pounds.

Up till the 12th January water had been obtained from a lake near the house, but after that date ice had to be melted. This meant a heavy drain on their fuel, and the quantity of tea had to be reduced one-half. On the 16th January, Lockwood was so weak that he could not rise without assistance. Cross was unable to walk, and several others of the party were becoming very weak.

Cross died on the 18th January; his habits had no doubt undermined his constitution, and he was therefore the first to succumb. He was buried 15 inches deep on the summit of a hill near the camp. Next day was his birthday, and it was found that he had saved up a considerable quantity of bread and butter to celebrate it.

On the 19th January it was found that the bread was overrunning the estimate, and the ration was increased a half-ounce. This partly dispelled the gloom caused by the first funeral. On the 21st January it was discovered that at some time twelve cans of milk had been stolen. On the 26th, Rice and Jens received an extra allowance of food, so as to strengthen them for a proposed trip to Littleton Island. At this time old leather boots were being burned to augment the fuel. The general ration was again slightly increased on the 28th. A still further increase was made on 1st February. On the 2nd, Rice and Jens started for Littleton Island, accompanied by Brainard and Christiansen for a short distance. They carried six days' rations. They returned on the 6th February, having found open water. Rice believed that he reached within 10 miles of Littleton Island. The trip exhausted Jens very much.

On 27th February the last of the onions, dog-biscuits, and coffee was reached. On 2nd March the last general issue of lemons took place, and the last can of milk was opened for Elison. On 3rd March, Frederick was promoted by Greely to be sergeant in place of Cross, who had died. This and similar promotions were afterwards disapproved of on the ground that there was "no precedent for them"! Red tape in its most vivid colours can evidently flourish in the land of "liberty."

On 11th March, Long and Christiansen were sent to Alexandra Harbour in search of game. They returned on the 13th very much exhausted. They saw no game and no tracks, except of a single fox. On the 14th, Brainard shot three ptarmigans, the first game obtained since early in February. Other three were shot on the 15th, and four dovekies on the 16th. On the 17th the rations had to be reduced to 7 oz. of bread and 4 oz. of meat. On the 21st a net was made in which to catch

shrimps, and next day about a pint was obtained. By this date the idea of crossing Smith Sound had been given up, as the strength of the party was insufficient for the task. On the 24th of March the entire party were in great danger of perishing from the fumes of the alcohol-lamp used in cooking. The chimney had been closed with rags, as usual, so that as much heat as possible might be retained in the hut at night, and the cooks had forgotten to remove the rags before beginning cooking. Several of the men were rendered unconscious, but soon recovered in the air outside the hut. It was remarked afterwards by all the men who got out of the hut, that every one attempted to assist his neighbour except Henry, who held himself aloof, evidently caring for no one but himself. Greely and several of the men suffered severely from frost-bites as the result of the exposure. After order was restored, and the breakfast cooked, it was found that a piece of bacon had been stolen. Jens had seen Henry take the bacon and conceal it within his shirt. Just before dinner, Henry complained of being sick, and soon after he vomited. Frederick, on examination, found that the vomited matter contained a considerable quantity of undigested bacon. A general investigation of Henry's conduct was made on the 25th, which clearly established his guilt, not only of the bacon, but that he took a double allowance of rum after the theft. Greely relieved Henry from duty, and he was prohibited from leaving his sleeping-bag except under the supervision of one of his comrades. Two days later, 10 oz. chocolate reserved for Elison was stolen, and Henry was suspected.

For the first time in five months a ray of sunlight entered the wretched hut on 25th March. On the 27th, Long was fortunate in obtaining thirty-three dovekies. On the 28th, Rice got 27 lb. of shrimps, Long secured fourteen more dovekies, and Christiansen shot a ptarmigan.

This success caused great rejoicing among the starving men.

On the 29th March, Elison wished the doctor to do something for his itching feet, unconscious that they had been gone since early in January. On the 3rd April all that remained of provisions consisted of 5 lb. of meat, 3 lb. of bread, and about 2 lb. of stearine to each man. From 20 to 30 lb. of shrimps were, however, being obtained daily.

The second death took place on 5th April. Christiansen, one of the Eskimo, had been thoroughly used up in the hunting expedition with Long, and never quite recovered. Extra food was given to him during the week previous to his death, in the hope of saving him. Lockwood had a great affection for him, and had much to say in his praise.

Deaths now followed one another quickly. Lynn became unconscious at 1 p.m. on 6th April, and died at 7 p.m. When dying he asked for water, but there was none to give him. The Isabella trip had weakened him both physically and mentally.

On the 6th April, Rice and Private Frederick started to attempt the recovery of the English beef which had to be abandoned to save Elison. They had wished to make the attempt earlier in the year, but Greely would not consent. Now, when provisions were almost gone, he agreed. Before leaving, Rice slept in the same bag containing his dead comrade Lynn, all unconscious of the fact that, in two days more, he too would pass away. The temperature when they started was 8° below zero. Next day they were confined to their bag twenty-two hours by a violent storm. They reached the place where the meat had been abandoned, but could not find it. Soon afterwards Rice showed signs of weakness. Frederick gave him some spirits of ammonia in rum, until he made some

tea. Then, giving him some warm food and drink, he urged him to walk, in order to avoid freezing. His condition had now, however, become so alarming that he could not stand up, and his mind continually reverted to home, relations, and friends. Frederick stripped himself of his jumper, in which to wrap Rice's feet. In his shirt-sleeves, sitting on the sledge, in a driving storm of wind and snow, he held his dying comrade in his arms for several hours, until he passed away. The feelings of Frederick may be imagined; his sleeping-bag had been left some miles away, and to reach it he must struggle against a cutting blast filled with drifting snow. Recovering strength by sleep and a little food, he returned 6 miles to cover his comrade with snow and ice. In returning to the camp at Cape Sabine, he dragged his sledge as far as his feebleness would permit, then took a little food, and getting into his bag, drank a spoonful of ammonia and rum, which enabled him to sleep. As soon as he awoke, he travelled on as before. In this way he hauled everything back to the camp, even including Rice's rations. It may truly be said that Rice laid down his life for his comrades. On several other occasions he had ventured it, especially on his extraordinary trips to Isabella, and towards Littleton Island. Rice's death deeply affected the party.

On the same day that this tragedy was being enacted on the ice, Lockwood breathed his last in the hut at Cape Sabine. Since the beginning of the year he had been extremely weak, but lingered on till the 9th of April. He was the most distinguished man of the party, his explorations having been the main achievements of the expedition. His name will remain in Arctic history.

"Jewell is much weaker to-day," were the last words Lockwood wrote. This was on the 7th April, and on the 12th Jewell died. On the 11th, Brainard fortunately

shot a bear, which probably saved the lives of some of the party; and on the following day Long shot a small seal. On the 13th the ration was increased to a pound of meat daily. On the 20th it had to be reduced to 10 oz. Towards the end of April, Greely was seriously ill, and in danger of dying. Henry, taking advantage of his illness, stole alcohol, and became hopelessly drunk.

On the 29th April, Jens and Long were out hunting, and watched a seal lying on an isolated floe. They hoped the floe would drift in to the fast ice, but after a long delay, Jens decided to try and reach it in his kayak. He crossed one lead, dragged his kayak across the ice, and entered a second. Long, who was looking on, saw Jens suddenly begin to paddle rapidly, and the next moment the kayak began to sink. Jens made an effort to get up on the ice, but it was new and could not bear his weight, and he was drowned. The kayak was probably cut when being dragged over the ice.

On the 3rd of May the last of the bread was used, and only nine days' meat remained. On the 6th a violent scene took place between Greely and Dr. Pavy regarding the doctor's reports. On the 12th, Greely decided to divide the last of the regular rations, as he was afraid that one or two of the worst men of the party might appropriate the remaining food, which was only sufficient to last till the 15th of May.

The want of provisions rapidly told on the starved men. Ellis died on the 19th, Ralston on the 23rd, and Whisler on the 24th. They now tried to feed on saxifrage (*Saxifraga oppositifolia*). On the 24th they had for dinner a handful of saxifrage, two or three spoonfuls of shrimps, and a pint and a half of tea. On the 26th there was a severe storm, which prevented Brainard going to obtain shrimps, and in consequence stews had to be made of the seal-skin thongs used for lashing the sledge.

Sergeant Israel, the astronomer, died on the 27th May. At the beginning of June, fourteen of the party were still alive, but did not expect to live long, unless the hunters were more fortunate or relief came quickly. On the 1st June they had a breakfast of shrimps and seaweed after a fast of thirty-four hours. Lieutenant Kislingbury died at 3 p.m. He was the only one of the party known by Greely before contemplating Arctic work. Although he had trouble with him at the commencement of their work at Conger, Greely acknowledged that he was a hard-working officer, and that he never spared himself in labours which would add to the personal comfort of others.

Salor died on 4th June. On this date, Greely, against the doctor's advice, decided to try to eat tripe de Roche. As Henry had been found stealing again, he was cautioned by Greely that he would come to grief if he did not stop it. Greely also gave written orders to Brainard, Frederick, and Long that if Henry was again caught stealing he was to be shot. Next day Frederick detected Henry stealing shrimps, and Greely found that he had been stealing seal-skin thongs contrary to positive orders. He was ordered to be shot, Greely giving the order in writing. It was carried out the same day.

On the 6th June, Dr. Pavy drank about 3 oz. of extract of ergot, having evidently mistaken it for a preparation of iron. He died the same day at 6 p.m., and Bender fifteen minutes before him. Greely states that Dr. Pavy was a man of fine education, polished manners, and great Arctic ambition. His medical skill was great, and contributed much to the general welfare of the party during the last winter. He thought, however, that his previous Bohemian life unfitted him for duty where his actions were subject to restriction or limitation from others.

For breakfast on the 7th all the shrimps were eaten,

and everybody began collecting reindeer-moss, tripe de Roche, and saxifrage. On the 11th June the party obtained a guillemot, and a second went to the hunters. Next day the nets for catching shrimps were lost through the floes breaking up. Gardiner appeared to be dead at 11 a.m. of this day, and was carried from the tent in which the party had been living for some time; but later he showed signs of life, and did not die until 5 p.m.

On 13th June, Greely issued to the party his seal-skin jumper for dinner. He also divided between them the dirty, oil-tanned covering of his sleeping-bag. Schneider died on 18th June.

Near midnight of the 22nd the whistle of a ship was heard. At first the party could hardly believe their ears. Brainard went to the brow of the hill, but no ship was to be seen. The party had resigned themselves to despair, when suddenly strange voices were heard, and they realised that they were saved. During the forty-two hours prior to their rescue a few square inches of soaked seal-skin was all the nutriment they received.

No relief or expeditionary vessels ever before ventured at so early a date the dangers of Melville Bay. Congress had offered a reward of 25,000 dollars for the first information regarding the expedition, and this had an important bearing on the rescue. The Scotch whalers set forth on their voyage many days earlier than was customary, and there was a friendly rivalry in the search between them and the American vessels in charge of Captain Schley, who, profiting by their experience and advice, won in the race for Cape Sabine.

Of the twenty-five men of the party eighteen had died. The living were: Greely, Brainard, Long, Frederick, Bierderbick, Connell, and Elison. It was found necessary, however, to perform secondary amputation in the case of Elison, and he died at Godhavn on the 8th of July.

As regards the responsibility for the great disaster which overtook this expedition, Greely admitted that, although not under orders to do so, he should have done more than arrange for a retreat to Cape Sabine in the event of not being reached at Conger. But little blame can be attached to him for this omission. It is easy to criticise after the event, but it seemed in the highest degree improbable that, if he could not be reached at Conger, there would be the least difficulty in the relief ships leaving sufficient supplies at Cape Sabine or other point on the west coast.

The disaster can be traced in the first place to the instructions given to Greely to abandon the station and retreat to the south in the event of no relief ship reaching him. It would have been much better to have left this question to Greely's discretion. If the party had remained at Conger another winter, it is highly probable that no disaster would have occurred.

In the second place, the chief responsibility undoubtedly lay with those who had charge of the relief. A ship was sent north in 1882, and failed in its mission; but instead of leaving its stores, or even part of its stores, at some point likely to be reached by Greely, those in command took the incredible course of returning south with the stores intact.

In 1883 those in authority must have known that absolutely nothing had been done in 1882, and that in the event of a failure to reach Conger taking place in 1883, Greely would certainly retreat southwards. One would therefore have expected that all possible precautions would be taken to insure the safety of the expedition. The possible wreck of one of the relief ships should have been arranged for, and steps taken to insure that sufficient supplies would not only be left at Littleton Island, but at some point on the west coast.

Serious responsibility was incurred by Lieutenant Garlington when he made the written statement that everything in the power of man would be done to relieve the expedition. All through the horrors of the winter nearly the whole of Greely's party believed to the last that a relieving party was at Littleton Island watching the first favourable opportunity to cross the Sound.

The whole arrangements for the relief ended in a gigantic muddle, and while nothing was done to lend assistance, Greely's party were induced by fair promises to camp in a practically barren region.

This expedition, and others which had preceded it, gave little encouragement to Americans to continue Arctic exploration, although the results achieved had been important. Kane lost the *Advance*; his party had to undergo great privations, and had ultimately to retreat in boats. The *Polaris* was lost, and many of the members of the expedition had to suffer greatly. De Long lost the *Jeannette*, and a large number of his party met a terrible fate; and now Greely's expedition was the climax of them all.

CHAPTER X

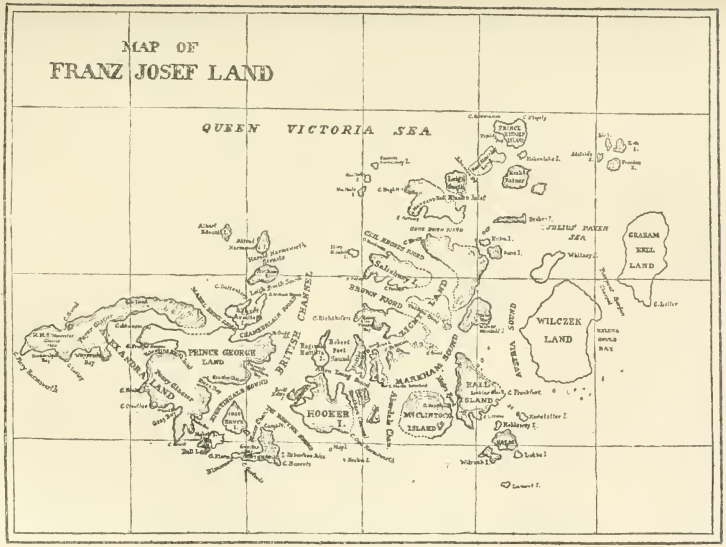
THE NORWEGIAN POLAR EXPEDITION (1893–96)

In many respects this expedition is unique. It was planned by Dr. Nansen after careful consideration of many scientific facts connected with the Polar Sea, and although his theories and conclusions were opposed by many of the leading authorities of the day, the expedition was carried out almost to the letter.

The *Jeannette* expedition had a very important bearing on that of Dr. Nansen. In 1884, Professor Mohn published a paper in which it was stated that various articles which must have come from the wreck of the *Jeannette* had been found on the south-west coast of Greenland. He believed that they must have drifted on a floe right across the Polar Sea. These articles included a list of provisions signed by De Long, the commander of the *Jeannette*; an MS. list of the *Jeannette's* boats; and a pair of oilskin breeches marked "Louis Noros," the name of one of the *Jeannette's* crew who was saved.

It occurred to Dr. Nansen that a ship might be allowed to be frozen in the ice and to drift as the articles from the *Jeannette* must have done. This idea was propounded in an address before the Christiania Geographical Society on 18th February 1890.

In this address Dr. Nansen brought forward various evidences in support of the theory that a current flows across or near the North Pole from Bering Sea on the


MAP OF
FRANZ JOSEF LAND
QUEEN VICTORIA SEA
PRINCE GEORGE LAND
ALEXANDRA LAND
HOOKER I.
McCLINTOCK ISLAND
HALL ISLAND
WILCZEK LAND
GRAHAM BELL LAND
JULIUS PAYER SEA
BRITISH CHANNEL
MARKHAM SOUND
AUSTRIA SOUND
WILCZEK SOUND BAY

one side to the Atlantic Ocean on the other. A "throwing-stick" used by the Alaskan Eskimo in hurling their bird-darts had been found among the drift-timber on the west coast of Greenland. It was also known that the driftwood that is carried down by the polar current along the east coast of Greenland and up the west coast consists largely of wood from the coast of Siberia.

After discussing the various possible routes by which this drift might take place, Dr. Nansen came to the conclusion that a current flows at some point between the Pole and Franz-Josef Land from the Siberian Arctic Sea to the east coast of Greenland.

Nansen's plan was to build a ship as strong as possible, so as to enable it to withstand the pressure of the ice. The sides were to slope sufficiently to prevent the ice, when it presses together, from getting firm hold of the hull, as was the case with the *Jeannette* and other vessels. Nansen's idea was that the ice, instead of nipping the ship, must raise it out of the water.

The *Fram* was built on the principles suggested by Nansen: its sides were from 24 to 28 inches in thickness, of solid water-tight wood. The inside of the ship was also shored up and strengthened in every possible way. The equipment was of the best, and special attention was devoted to the commissariat; most of the provisions were soldered down in tins, as a protection against damp.

The members of the expedition numbered thirteen. Several places were visited in passing up the coast of Norway, and the party received a great reception. Norway was left at Vardo; and about four days afterwards, on the 27th July 1893, ice was met with.

It was Nansen's intention to pass through Yugor Strait and make his way along the coast until he reached the New Siberian Islands, and then up the west coast of these

as far as possible before he allowed the *Fram* to be frozen in.

At Khabarova, Yugor Strait, thirty-four dogs which had been sent there by previous arrangement were obtained. Some days were spent here in making repairs, shifting coal, etc. A ship loaded with coal was to meet the *Fram* here, but turned up two days late, having been delayed by ice. The *Fram* left Khabarova on 5th August, and after careful navigation in a fog, succeeded in passing through the Yugor Strait into the Kara Sea. Cape Chelyuskin, the northernmost point of Asia, was reached on the 10th September. On the 12th September two walruses were shot and secured. On the 18th September the course was shaped northwards, to the west of the New Siberian Islands, and the *Fram* had a straight run until the 20th September, when it was stopped by ice near latitude 78°. The edge of the ice was now followed towards the north-west, and about 78½° was reached. On the 24th September they found that the ship was being frozen in. An observation taken on the 29th gave latitude 79° 5′. By 8th November they had drifted as far south as 77° 43′; on the 19th November they were north to 78° 27′; and on the 23rd November they reached 79° 11′, which was the highest yet reached. On the 27th November an altitude of Jupiter was taken, and the latitude found to be 78° 36′, from which it was believed that a mistake had been made on the 23rd. By the end of the year they were not much farther north; sometimes the drift was one way and sometimes the other. Several bears made their appearance and were shot; foxes were also seen.

As early as 15th January 1894, Nansen began to speculate about the possibility of leaving the ship and making a sledge-journey over the ice towards the Pole, but he decided to first wait and see the result of the drift. On one point Nansen's calculations had proved

incorrect: he had presupposed a shallow Polar Sea in which all currents would have a strong influence. Instead of this, it was found in latitude 79° that with a line of 1000 fathoms the bottom could not be reached. The greatest depth hitherto found in these regions was 80 fathoms.

It was not until the 1st of February 1894 that the 80th degree of latitude was reached. On the 6th of April a remarkable event took place, which had been looked forward to with lively interest. It was an eclipse of the sun. Hansen, who had charge of the astronomical observations, calculated that the eclipse would begin at 12.56. It really was seen to begin 7½ seconds later than the time calculated. This proved the chronometers to be in excellent order. Four bears made their appearance on 8th April; none had been seen during the three previous months. The 81st degree of latitude was reached about 17th May 1894, and the 82nd not until the 31st October 1894.

On the 5th of November a curious incident happened, and is worth mentioning. One of the young dogs was heard howling fearfully on deck. It was found to have touched an iron bolt with its tongue, and was frozen fast to it. The poor beast was straining to get free, with its tongue stretched out so far that it looked like a thin rope proceeding out of its throat. The bolt was heated by means of the hand, and the puppy then managed to get the tongue free.

On 16th November, Nansen elaborated his plan for the sledge-journey towards the Pole in the spring of 1895. He made his calculations from the 83rd degree of latitude, and he expected that the *Fram* would reach a higher latitude than this. The distance to the Pole from this latitude is 483 English miles. Nansen thought it reasonable to expect that this distance could be covered in fifty days,

which would give about 9½ miles a day. The expedition was to consist of twenty-eight dogs, and two men, with 2100 lb. of provisions and equipments. Nansen calculated that in fifty days the dogs would consume 1400 lb. of pemmican, allowing a pound a day for each dog. Two pounds of provisions daily for each man was allowed. In returning, he intended to make for either the Seven Islands, north of Spitzbergen, or Cape Fligely in Franz-Josef Land, according to circumstances. Setting out on the 1st of March, he expected to reach the Pole at the end of April, and have about 500 lb. of provisions left for the return journey. This would not allow anything for the dogs, so it was intended to kill some to feed the others. Allowing for the gradual reduction of weight on the return journey, Nansen calculated that Cape Fligely should be reached about the 1st of June. From here he would decide whether to return along the north-west coast of Franz-Josef Land by Gillis Land towards North-East Island and Spitzbergen, or south through Austria Sound towards the south coast of Franz-Josef Land, and thence to Novaya Zemlya or Spitzbergen.

Nansen decided that Johansen should be his companion. He was a lieutenant in the Reserve, and was so eager to go in the *Fram* that, as no other post could be found for him, he accepted that of stoker. He afterwards assisted Hansen in taking scientific observations.

On 20th November, Nansen delivered an address to the whole ship's company, in which he announced his determination to make the sledge-journey. Preparations were now made in earnest. During the summer Nansen had already begun to make a kayak, the frame of which was of bamboo carefully lashed together. When completed, the framework weighed 16 lb. It was afterwards covered with sail-cloth, when the whole boat weighed 30 lb. It was 12 feet long, 28 inches wide in the

middle. and 12 inches deep. Another kayak was made with a depth of 15 inches. These kayaks were chiefly intended for crossing over channels and open spaces in the ice, and coasting along possible land. They were essentially like Eskimo kayaks, full-decked, save for an aperture in the middle for a man to sit in. This aperture was encircled by a wooden ring, after the Eskimo fashion, over which the lower part of the seal-skin jacket could be adjusted so that the junction between boat and jacket was water-tight. Besides this aperture in the middle, there were small trap-doors fore and aft in the deck, for the convenience of stowing provisions. Two sledges were made about the same length as the kayaks.

On 12th December 1894 it was found that the *Fram* had attained a higher latitude than had ever before been reached by a ship, the observation giving 82° 30′. A great feast was held in its honour.

On the 3rd of January 1895 the *Fram* received such an alarming pressure from the ice that all preparations had to be made in case the ship would have to be abandoned. By the 6th of January the ice became quiet, and the danger was over. On this day the latitude was found to be 83° 34′, so that the expedition had now reached the most northern latitude; the record of Lockwood had been beaten.

Preparations for the long sledge-journey were now hastened. Bolsters filled with pemmican and dried-liver pie were made to fit the sledges and form a bed on which the kayaks were to rest. These bolsters when filled weighed from 100 to 120 lb. each. Three sledge-sails were made of very light calico, and were about 7 feet 2 inches broad by 4 feet 4 inches long; they were made so that two of them might be laced together and used as one sail for a double sledge.

On 26th February, Nansen and Johansen left the ship

along with five of their companions who were to accompany them a short distance. During the first day, however, one of the sledges broke down seriously, and the whole party returned to the ship, so that all the sledges might be strengthened.

On 28th February a start was again made, with six sledges instead of four. A broad board was fitted lengthwise to the sledge, underneath the cross-bars, so as to protect them against projecting pieces of ice. They had not proceeded far from the ship when Nansen came to the conclusion that the load was too heavy, and several sacks with food for the dogs were left behind. On the 3rd of March, Nansen again decided to return to the ship. The progress made with six sledges was unsatisfactory, and the cold was severe.

On the 14th of March they left the *Fram* for the third and last time. As regards clothing, Nansen had on the upper part of the body two woollen shirts; outside these a camel's-hair coat, and last of all a thick rough jersey. Instead of the jersey, Johansen wore an "anorak" of thick homespun, provided with a hood. On the legs they had, next the skin, woollen drawers, and over these knickerbockers and loose gaiters of close Norwegian homespun. To protect them from wind and fine-driven snow, they wore a suit made of a thin, close kind of cotton canvas, and consisting of an upper garment to pull over the head, provided with a hood, and a lower one in the shape of a pair of wide overalls. Instead of wearing long stockings, Nansen preferred to use loose stocking-legs and socks, as these were more easily dried on the chest when asleep at night. For travelling over snow in a low temperature, Nansen recommends Finn shoes. They are warm and strong, are always flexible, and very easy to put on and take off. They must, however, be made of the skin of the hind-legs of the reindeer buck. In milder weather they

had leather boots of the "komager" type, made of under-tanned ox-hide, with soles of the skin of the blue seal. Inside the Finn shoes they used "sennegraes," or sedge grass, which absorbs moisture and keeps the feet dry.

On their hands they wore ordinary woollen mittens, and above these large gloves of wolf-skin, neither of them having divisions for the fingers.

On their heads they wore felt hats, which shaded the eyes from the dazzling light, and were not so pervious to the wind as an ordinary woollen cap would be. Outside the hat they generally had one or two hoods of cloth.

To sleep in, they used a double bag of adult reindeer-skin.

In Nansen's opinion, a tent should always be carried. He thinks that the inconsiderable increase in weight is more than compensated for by the extra comfort. The tent used was square at the base and pointed at the top, and was pitched by means of a snowshoe-staff which served the purpose of a tent-pole. The walls were kept down by pegs, and then banked carefully round with snow to exclude wind and draughts. At first Nansen tried a tent with a canvas floor attached, but found that snow and moisture collected on this and added much to the weight. The whole tent weighed a little over 3 lb.

The cooking apparatus consisted of two boilers and a vessel for melting snow or ice. A Swedish gas-petroleum lamp, known as "The Primus," in which the heat turns the petroleum into gas before it is consumed, was used for heating. Nansen used petroleum because it generates more heat in comparison with its weight than alcohol. He took with him 4 gallons, and this enabled them to cook two hot meals a day and melt an abundance of water during 120 days.

Several pairs of snow-shoes were taken. Their firearms consisted of two double-barrelled guns, each having a

shot-barrel of 20 bore, and a barrel for ball of about ·360 calibre; and the ammunition amounted to about 180 rifle-cartridges and 150 shot-cartridges.

The instruments were: a small theodolite, a pocket sextant and artificial horizon, a light azimuth compass and two other compasses, two aneroid barometers, two minimum spirit-thermometers, three quicksilver sling-thermometers, an aluminium telescope, and a photographic camera.

As regards provisions, the chief article was pemmican, but there was also a good supply of butter, calf's liver, albuminous flour, wheat-flour, whey-powder, cornflour, sugar, vril-food, chocolate, oatmeal, white bread, aleuronate bread, fish-flour, dried potatoes, cocoa, a "special food" made of pea-flour, meat-powder, fat, etc., and a few others. An important point as regards provisions is that the food should be in a condition to be eaten without cooking, in case the fuel be lost or used up.

During the first week the travelling was good, from 9 to as many as 20 miles being covered daily. On the 22nd of March the latitude was found to be 85° 9′. From this time onward the ice was bad. The temperature at first was very low, frequently more than 40° below zero. On 29th March the latitude was found to be 85° 30′, although Nansen expected that he had reached 86°. This probably indicated that the ice was drifting southwards. On 30th March, when one of the sledges was going over a crack in the ice, all the dogs fell in, and had to be hauled out. The next sledge fell in, and had to be unloaded before it could be got out. Next day Johansen in crossing a lane went through the edge of the ice, wetting both legs, which soon became covered with a mass of ice.

A great deal had always to be done before starting off on the day's journey. The breakfast had to be cooked; sometimes a sledge had to be relashed; a hole would be

found in a fish-flour sack which had to be sewed up; and the dogs' traces had to be disentangled with great difficulty. On the 1st April they kept on the move so long that it was too late to wind up their chronometers. Johansen's had stopped altogether, but Nansen's was still ticking. The ice was now becoming worse and worse, and Nansen began to have doubts as to the wisdom of going northwards much longer.

On the 3rd April the second dog was killed as food for the others. Nansen now calculated that the distance to Franz-Josef Land was three times as far as the distance they had come. He saw that it was impossible to reach the Pole or its immediate vicinity over the ice they were encountering, with the dogs they had. He now wished that the number of dogs had been much greater. On 4th April the latitude was 86° 3′. On the 8th April, Nansen finally decided to return and shape his course for Cape Fligely, in Franz-Josef Land, about 450 miles distant. The latitude of the farthest north point was found to be 86° 13·6′, and the longitude about 95° E.

During the first few days on the return journey they met with comparatively level ice, much to their surprise; but they soon began to meet more open lanes. On the 12th April they had the misfortune to let their chronometers run down. This was the cause of much worry afterwards. On 16th April, Nansen calculated that they were 60 miles on their way home. The temperature had now risen to about 15° below zero, and they considered this mild. A dog had to be killed every few days in order to feed the others. They considered this slaughtering of the faithful animals a horrible affair, but it was an absolute necessity.

On the 21st April they came across an immense piece of timber sticking out of the ice. Nansen believed it to be Siberian larch. Johansen marked it "F. N., H. J.,

85° 30′ N." On the 25th April fox-tracks which were fresh were seen in the snow. This discovery raised the question whether land could be near, but the weather was so thick that it might have been near and could not be seen.

Open water in the form of lanes in the ice now became more frequent, but Nansen was still reluctant to use the kayaks. There were several large holes in them which would require to be repaired, and in the present condition of the ice Nansen believed that it would be difficult to protect the bows of the kayaks from being cut, and in the event of water getting in, ice would immediately form, and to remove it would be impossible.

On 3rd May the dogs had been reduced to sixteen. Two days later the latitude was found to be 84° 31′, and longitude 66° 15′ E. This was not so far south as Nansen expected, but farther west.

In some places the snow was very deep among the rough ice, and as the snow-shoes had frequently to be taken off for the purpose of helping the sledges over difficulties, Nansen regretted that he had not also Indian snow-shoes, which would have been of more use in such circumstances.

On the 14th May, during a storm, the opportunity was taken to remove the load from one of the sledges which was not now required. An attempt was made to use the wood of the sledge as fuel, but after burning nearly the whole of it and succeeding in obtaining only one pot of boiling water, they gave it up as a failure, and went back to the "Primus."

They had for some time been expecting to see land daily, but there was still no appearance of it. The open lanes of water were causing more and more trouble. On the 17th May a school of narwhals was seen in one of them, but none was obtained. On the 19th May the first bear-

tracks were seen. On the 25th the latitude was found to be 82° 52′, and yet there was no land in sight. Payer had supposed Petermann Land to be in latitude 83°.

The first bird was seen on 29th May, and seals made their appearance soon afterwards. On the last day of May only seven dogs remained. On the 2nd of June it was found that it was necessary to make use of the kayaks, and preparations were made to put them in proper order. The covers were patched and the frames relashed. It was not until the 8th of June that everything was ready for a fresh start, and then it was found that all the lanes had closed, so that the kayaks were not yet required. For the first time the temperature rose above the freezing-point on 6th June.

The travelling was now extremely difficult, and they had to be satisfied with journeys of 1 and 2 miles daily. Sometimes it was found that they had drifted about as far northward as they had travelled southward, and it became a serious question whether they were likely to reach land. Although about the latitude of Cape Fligely, there was no appearance of land, and Nansen was in great difficulty over his longitude, due to the time when the chronometers ran down. He calculated and recalculated his observations without making the matter any more clear. Sometimes he thought he might be east of Cape Fligely, and sometimes that he might be to the west.

About the middle of June, three months after they left the *Fram*, they began to see signs of returning life. Little auks were numerous, more bear-tracks were seen, and on the 22nd June they were fortunate enough to kill a seal. This seal was one of the large bearded variety (*Phoca barbata*), and supplied sufficient food and fuel to last a month.

The killing of the seal furnished a very exciting incident.

It was on the first occasion that the kayaks were used. They had just crossed a pool, and Nansen had hauled one of the sledges half-way on to the ice when the seal appeared and was shot by Johansen. Nansen seized a harpoon and threw it deep into the fat back of the seal. Meanwhile the sledge, which had been drawn partly on to the ice, slid down again, and the kayaks with Johansen and the dogs were set adrift. He tried to drag the sledge up on to the kayak, but failed. The sledge gradually heeled the kayaks over until one side of Johansen's was in the water. The cooker which was on the deck fell off and drifted away; the snow-shoes followed. Nansen meanwhile was holding on to the seal, but had to let go and assist in preventing the kayak from sinking. In the end, the lost articles were rescued, and the seal hauled on to the ice. They had previously reduced their rations and fuel to a minimum, but now they feasted on seal's flesh and blubber. It was decided to remain here some time, to see if the ice would open to allow the kayaks to be used. About this time they abandoned everything that was not absolutely necessary, so as to lighten the load as much as possible—even the sleeping-bag was left behind.

From this camp they first saw land without being aware of what it was. While still waiting at this camp, a bear with two cubs put in an appearance, and after a difficult chase over ice and lanes, all three were shot. This fortunate occurrence supplied an abundance of food. Nansen and his companion remained at this place, which was named "Longing Camp," until the 22nd July. A great deal of meat had to be left behind, and a good many articles, such as a hammer, Finn shoes, a frying-pan, sail-cloth, etc. In place of these articles, some flesh from the seal and bear was carried.

Land was first detected on 23rd July. It had been observed before, but the snow-fields were mistaken for

clouds. It had long been expected, and now it gave the travellers great joy.

On 29th July, Nansen began to suffer from lumbago, probably caused by sleeping on the bare ice. It gave him severe pain during several days.

When land was first seen, Johansen expressed the opinion that it would be reached next day. Due, however, chiefly to the drift, the journey occupied thirteen days.

On the 4th of August, Johansen nearly lost his life. They had reached a lane, and were preparing to launch the kayaks, when Nansen heard Johansen cry to him to take the gun. On looking round to see what was the matter, he saw an enormous bear standing over Johansen, who was on his back. Nansen tried to seize his gun, but his kayak slipped into the water, and it took some little time to pull it out again and to reach the gun, which was in its case on the fore-deck. Luckily one of the dogs came to the rescue, and the bear turned its attentions to it. This enabled Johansen to wriggle himself out of its grasp, and the next moment Nansen fired, and the bear dropped dead.

At last, on the 6th of August, open water was reached. For some time the dogs had been reduced to two in number, and now that open water had been gained, Nansen could not see how the two dogs could be taken farther. He was sorry to part with them; they had been faithful and enduring, and had followed him the whole journey through. A cartridge was sacrificed on each.

The two kayaks were lashed together, and the sledges placed on deck, one in front and one behind. Before going far, the wind rose sufficiently to enable a sail to be used, and soon the margin of a glacier was reached. This was from 50 to 60 feet in height, and landing was there-

fore impossible. The margin of the glacier was followed towards the west, and it was found necessary to land on a drifting floe in order to obtain sleep. Next day, when they turned out, they found the ice packed around them ; but fortunately the open water was not far off to the west, and they reached it without much difficulty. Birds were now plentiful, and it was with great satisfaction that they observed the signs of animal-life, and knew that they could obtain food. Later on they discovered that the land they were coasting along consisted of islands. The first three Nansen named "Eva's Island," "Liv's Island," and "Adelaide's Island" respectively. South of these the land had probably been seen by Payer.

On the 11th of August, while Nansen was on a hummock inspecting the waters ahead, a huge monster of a walrus came up near the kayaks. No notice was taken of it, but it came up snorting, sometimes on one side and sometimes on the other, and threatened to thrust its tusks into the frail kayaks. Ultimately Johansen shot it through the eye, and with a terrific bellow it rolled over and disappeared. Not long afterwards, Johansen's kayak received a violent shock from another walrus, which was shot dead through the forehead by Nansen. With great difficulty, they managed to cut a hole in the thick skin, and obtained some walrus meat and blubber.

On the 12th of August it was decided to cut off the ends of the sledges, so as to be able to use the kayaks singly. This was done, and better headway was made ; but frequently the channel closed, and the sledges had to be hauled over the ice. On the 14th of August an iceberg some 50 to 60 feet in height was seen, and this was the highest met with off Franz-Josef Land. On this day they had bare land under their feet for the first time in two years. The Arctic poppy was here in flower. The imperfections

of Payer's map at this point greatly confused Nansen, and he was not yet certain whether the land reached was part of Franz-Josef Land. A sound to the west, which he at first supposed to be Rawlinson's Sound, did not at all agree with the description given by Payer. Nothing was to be seen of Dove Glacier, which was supposed to bound the Sound on one side. Nansen reasoned that if they were in Rawlinson's Sound they must have traversed the glacier and Wilczek Land without seeing any trace of either, for they had travelled westwards a good half-degree south of Cape Buda-Pesth. Nansen, therefore, was inclined to believe that the land was new, and must be to the west of Franz-Josef Land. But the next puzzle was that if this was the case, the new land must be very far to the west, for nothing had been seen of Oscar's Land. For the present the question was left in a state of doubt.

When they rounded the headland to the west, they were delighted to find open water as far as they could see, and that the land was trending south-west. Their hopes of getting home now ran high, but soon afterwards a storm delayed them four days and three nights, and the ice packed close along the coast. This, at one blow, destroyed all hope of getting home that year. While camping during the storm, a bear came to the tent and was shot by Nansen. As food was becoming scarce, this was a fortunate occurrence.

From the 24th of August till 6th December there was a gap in Nansen's diary. On the latter date he began to fill up the blank.

After being stopped by the storm, and then drifted out to sea on the ice, they sailed for a whole day in open water in their kayaks. On the following day the weather became stormy, and they were obliged to land. Scarcely had they reached the shore when a bear was seen and

promptly shot. Walruses were also seen in great numbers. After feasting on the bear's flesh, they lay down to sleep, but were awakened during the night by a peculiar sound outside the tent. This was found to be caused by a she-bear and her young one, but as Nansen thought they had already sufficient food for the present, they were allowed to escape. Next day the ice had again been driven against the shore, and as they could not proceed they decided to make themselves more comfortable by building a temporary hut of stone. The roof was made of the silk tent spread over snow-shoes and bamboo rods, and the doorway was closed with their coats. Daylight could be seen between the stones on all sides, but yet they considered it comfortable. The way south was still blocked on the following day, which was the 28th of August, and Nansen finally resolved on remaining here during the winter. He was afraid that if he went much farther south he might not have sufficient time to build a house and obtain food. He therefore decided to begin at once and lay in stores while game was yet plentiful. They first decided to attack the walruses, and as they were emptying the kayaks in order to be prepared, a she-bear and her cub were seen coming along the edge of the ice, and both were shot. This was a good beginning. Next day they tried their luck at walrus-hunting. A walrus was soon found, but nine cartridges had to be expended before the monster was killed, and then, before they could get near enough to use a harpoon, it sank and disappeared. They returned to the shore very much crestfallen.

They now found two walruses lying asleep on the shore-ice, and stole cautiously up to them. Nansen fired at the back of the neck of one, and killed it with the first shot. The other one was struck too far forward in the head, and required three bullets to kill it. They had now to

skin them, but as there was a danger of being sent adrift, the wind having risen, Nansen took the wise precaution of bringing up the kayaks and sledges. It was as well he did so, for while they were busily engaged skinning the animals, the wind rose rapidly, and they suddenly discovered that the ice had broken off and that they were adrift. They hurriedly cut off as much walrus-flesh as possible and flung it into the kayaks, but it was a hard pull to reach the shore in the storm. Meanwhile the ice on which the bodies of the walruses were, drifted out to sea and disappeared. During the following night they were again awakened by a bear outside the hut. It was a she-bear with two large cubs. The mother was shot, but the cubs took to the water, where they reached a piece of floating ice. Nansen decided to go out in the kayaks after the cubs. When they went to get the kayaks, they found that the bears had been at the walrus-meat and devoured every piece of fat and blubber on it. One of the kayaks was thrown half into the water, and the other high up among the stones, but fortunately they were still seaworthy. The kayaks were launched, and the cubs chased to land, where they were shot. Three bears in one day was good work, and to add to their satisfaction, the sunken walrus shot on the previous day was found floating at the edge of the ice. It was towed into a place of safety in a creek and made fast. After skinning the bears and covering up the flesh, they turned in for sleep, as they had obtained little the two previous nights. On the 2nd September they set to work on the skinning of the walrus. Another walrus, evidently curious to see what was going on, came into the channel where the dead walrus was lying, and approached right up to the edge of the ice where Nansen and Johansen stood. Its curiosity cost it its life, and there were now two walruses to skin instead of one. This work was far from agreeable: they

had to lie on the animals and cut down as far as they could reach below the water, and they were soon saturated from head to foot with blubber and oil and blood. To make matters worse, they had no chance of changing their clothes during the winter; but it was a work of necessity, as the walrus-blubber was needed for fuel.

On 7th September the building of the permanent winter-hut was commenced. Stones were quarried from among the débris at the foot of a cliff near by, and part of a sledge-runner had to do duty as a pick. A spade was made out of a shoulder-blade of a walrus tied to a piece of a broken snowshoe-staff. The walls were built of stone, with moss and earth between, and were finished in one week. They were scarcely 3 feet in height, but an equal distance had been dug into the ground, so that the hut was high enough to stand in. The forming of the roof was the greatest difficulty. However, a piece of driftwood had been found on the shore, and after a day's work Johansen succeeded in cutting it in two with a small axe. These formed the ridge-piece, and walrus-hides formed the rest. In one corner of the hut a little hearth was made to cook upon, and above this a round hole was cut in the walrus-hide. A smoke-board was made of a bear-skin. The hearth had not been used long before it was found necessary to build a chimney. This was erected on the roof, and as the only materials were ice and snow, it was not altogether free from the drawback of sometimes dripping down on the hearth. Lamps were made by turning up the corners of some sheets of German silver. These were then filled with crushed blubber, and wicks were made from bandages. They gave a good light, but assisted very little in raising the temperature. A sleeping-shelf made of stone was erected along the back wall of the hut, but although bear-skins were spread on this it always remained hard and un-

comfortable. The door consisted of an opening at one corner of the wall, which led into a short passage, dug out in the ground, and then roofed over with blocks of ice. The inner opening was covered with a bear-skin, and another skin was laid over the outer opening. The hut was 10 feet long and 6 feet wide. The cooking was very simple: it consisted in boiling bear's flesh and soup in the morning, and frying steak in the evening. Large quantities were consumed at every meal, and yet they never tired of it, and had always good appetites.

While building the hut an anxious look-out was kept for bears, as none had been seen for some time, and too little meat had yet been obtained to last during the winter. On the 23rd September one was found beside a walrus-hide which had been put in water to thaw. Soon afterwards a second bear was seen gnawing at the hides on the roof of the hut. Both were shot. On the 24th September two more walruses were shot, and from these they obtained all the blubber they now required. On the 26th September a bear was seen out on the ice, but when Nansen approached it made off. He fired twice at long range, the second shot wounding the animal. It leaped and struck the ice, and finally broke through into the water. It then made desperate efforts to regain the ice, but the ice always broke under its weight, and ultimately it died in the water. Nansen and Johansen by means of a rope attempted to haul the bear up on to the ice, but they found the weight beyond their powers, and the ice always gave way. By making a narrow crack sufficient to allow the rope to pass, they dragged the bear under the ice to the shore, where they made a hole and managed to draw it out. After skinning the animal, they carried as much of the meat as they could to the hut. When they neared the place where their blubber was heaped, they were

astonished to see three bears tearing at it—a she-bear and two young ones. The mother was killed, but the two young ones escaped. On the morning of 28th September a large bear was found sleeping on the blubber-heap, and was shot. It had eaten an enormous quantity of the blubber, and had also killed the two young bears which escaped.

The foxes caused a good deal of trouble during the winter. They stole everything they could move. Pieces of bamboo, steel wire, harpoons and harpoon-lines, a collection of geological specimens, a ball of twine, and lastly a thermometer, were all carried off.

On the 15th of October they saw the sun for the last time above a ridge to the south. The last bear was shot on the 21st October, and no more were seen until the spring.

The life during the winter was very monotonous. It consisted chiefly of cooking and eating, and taking a little exercise when weather permitted. On Christmas Eve preparations were made to celebrate Christmas, but these preparations were of a very limited character. Johansen turned his shirts and put the outside one next the skin. Nansen did likewise, and washed himself in a quarter of a cup of warm water, using a dirty pair of drawers as sponge and towel. For supper they ate a small portion of the provisions they had preserved for the journey south in the spring. Only on this occasion and on New Year's Eve were these provisions touched during the winter.

Birds again made their appearance on 25th February, and a bear was shot on 8th March. This bear came in good time; the supply of oil was running low, and they could only afford to cook once a day. Another bear was shot on 2nd April, and as they now had a considerable quantity of blubber and meat, preparations were made for the journey south. But a great deal required to be done.

New clothes had to be made out of blankets; the wind-clothes had to be patched; the "komager" had to be soled; and socks and gloves had to be made out of bear-skin. Then a light sleeping-bag of bear-skin had also to be made. The hut was therefore suddenly transformed into a tailor's and shoemaker's workroom. Thread was obtained by unravelling the cotton canvas of some provision-bags.

Nansen was as pleased as a child with a new dress when on 12th May he was able to put on his blanket-trousers, strengthened inside and out with pieces of an old pair of drawers and of a shirt.

The stores which had been buried at the beginning of the winter were now dug up, and greatly to Nansen's disappointment it was found that several articles had been spoiled by the damp of the previous autumn. The flour had got mildewed; the chocolate had been dissolved by the damp; the pemmican was uneatable. There remained a limited quantity of fish-flour, some aleuronate flour, and some half-moulded bread, which they carefully boiled in train-oil, partly to dry it, and partly to render it more nutritious by impregnating it with fat. They also cut up as much raw bear's flesh and blubber as they could carry. Train-oil took the place of petroleum as fuel. They still had 100 rifle-cartridges and 110 smallshot-cartridges, and their rifles were in good condition.

The hut was left on 19th May, after a short record of the journey had been deposited in a brass tube plugged at each end and hung by a wire to the roof. During the first few days they made short marches, until they again became accustomed to the work. On 22nd May they had to shelter from a snowstorm, and on the 23rd the weather was still bad, and they only went a short distance. On the 24th, Nansen narrowly escaped being drowned. While Johansen was busy with his kayak,

Nansen pushed ahead to look for a camping-ground, but suddenly the ice gave way, and he found himself lying in a broad crack which had been concealed in the snow. He tried to get out again, but his snow-shoes were firmly fastened, and he was also tied by the harness to the sledge, so that he could not turn round. Fortunately, he had been able, when falling, to dig his pike-staff into the ice on the opposite side of the crack, and he held himself up by that, and lay waiting for Johansen to come up. The latter, however, had not noticed the accident, and was still busy at his sledge and kayak. Meanwhile the water was creeping farther and farther up Nansen's body, and he began to shout for help. At last he was observed by Johansen, who arrived just in time to prevent Nansen from going completely under the water. In future the snow-shoes were not firmly attached when the ice was thought to be dangerous. From the 26th to the 28th May they were weather-bound, and after advancing a short distance on the latter date, they had again to take shelter until the 3rd of June. As provisions were now getting low, a walrus was shot, and a supply of meat and blubber thus obtained. On the 4th June they were able to launch their kayaks for the first time, and made great progress. On the 6th they had again to take to the ice, but as there was a strong north wind and the surface was favourable they were able to make good use of the sledge-sail. On the 8th they were stopped by a furious storm, and next day they had to make a long détour westwards in order to avoid treacherous ice. On the 12th they were able to sail all day long. In the evening they felt their legs stiff with sitting in the kayak all day, and they landed on the edge of the ice so that they might stretch them a little. They then wished to ascend a hummock, so that a view might be obtained over the water. After the kayaks, which were lashed together,

had been moored by means of one of the braces, they ascended a hummock close by, and had been standing only a short time when Johansen raised the cry that the kayaks were adrift. A rush was made to the edge of the ice, but the kayaks were already a little way off and were drifting quickly. The position was a terrible one, for all they possessed was on board the kayaks. Nansen at once threw off some of his clothing, handed his watch to Johansen, and sprang into the icy water. He knew that if the kayaks were lost it meant death to him and his companion. At first it seemed more than doubtful whether he could manage to regain them. When he got tired, he turned over and swam on his back. At length he gained a little on the kayaks, and he redoubled his exertions. By this time Nansen felt his limbs gradually stiffening and losing all feeling. His strokes became more and more feeble, but the distance from the kayaks became shorter, and at last he was able to grasp a snow-shoe which lay across the sterns. He now tried to pull himself up, but his body was so stiff with cold that this seemed an impossibility. After a little, he managed to swing one leg up on to the edge of the sledge which lay on the deck, and then raised the rest of his body. They were saved! With some difficulty he paddled the kayaks back to Johansen, who confessed that these were the worst moments he had ever lived through. Johansen now pulled off Nansen's wet clothes, put on the few dry ones they had in reserve, spread the sleeping-bag upon the ice, and covered Nansen with the sail and everything he could find to keep out the cold. Next day Nansen was all right again, and in the evening the journey was continued.

On 14th June great herds of walruses were met, and as meat and blubber were at a low ebb, a young one was shot. Two days afterwards, a walrus nearly turned the tables on them. It came up close beside Nansen's

kayak, threw itself on the edge of it, took hold farther over the deck with one fore-flipper, and tried to upset the frail craft. Nansen struck at its head with the paddle, while it in turn struck at the kayak with its tusks. It was only when the deck was almost under water that it suddenly disappeared. Nansen was congratulating himself on his fortunate escape, when he noticed his legs getting wet, and he had only time to run the kayak on a sunken ledge of ice when it sank. It was as well that the ice was near at hand, or the result would have been serious.

In the afternoon of the 17th June, Nansen had ascended a hummock to have a look at the land beyond. Flocks of auks were flying to and fro making a confused noise, and as Nansen listened, a sound suddenly reached his ear, so like the barking of a dog that he started. He waited for some time, listening intently, till the barking began again and there was no room for doubt. He shouted to Johansen that he heard dogs. Johansen started up from the bag where he lay sleeping, and tumbled out of the tent. He tried to hear the sound, but could only make out the noise of the birds. Nansen, however, was convinced that he heard dogs, and he prepared to make for the land, leaving Johansen to stay behind with the kayaks, so that there might be no risk of their drifting away again. He had not gone far when he observed tracks which were probably those of a dog. Then he again heard the yelping of a dog more distinctly than ever. It was with a strange mixture of feelings that he made his way towards land. Suddenly he thought he heard a shout from a human voice, and he ran up on to a hummock and hallooed with all his might. Soon he heard another shout, and saw a dark form moving among the hummocks. It was a dog, and farther off was seen a man. Nansen approached quickly and waved his hat; the man did the same. Nansen heard him speak to the

dog, and recognised that the language was English. As he drew nearer, Nansen thought he recognised Mr. Jackson, whom he had once seen. They extended a hand to one another, with a hearty "How do you do?" Explanations quickly followed, and Nansen was led to Jackson's hut at Cape Flora. Here he received a royal welcome from the members of the Jackson-Harmsworth Expedition. Men were immediately sent to Johansen's assistance, and his reception at the hut was scarcely less hospitable than Nansen's. Their feelings may be imagined when they were able to throw off their dirty oily rags and have a hot bath, and to be able to put on clean clothes. To add to Nansen's delight, Jackson had a packet of letters for him, and these contained only good news.

It is an interesting fact that Nansen when he arrived at Cape Flora weighed no less than 22 lb. more than when he left the *Fram*, and Johansen weighed 13 lb. more. Bear's flesh had evidently agreed with them.

On a comparison of Nansen's chronometers being made, it was found that they were not so far out as had been anticipated. They were about 26 minutes wrong, making a difference of $6\frac{1}{2}°$ in longitude.

The *Windward*, which was to bring supplies and take home some of Jackson's party, arrived on the 26th July. By this time Nansen and Johansen began to fear that the vessel could not get through the ice and that they would have to spend another winter in the Arctic regions. News soon arrived that all was well at home, and that nothing had been heard of the *Fram*.

The *Windward* left Cape Flora on 7th August, and reached Vardo, in Norway, on the 13th. Nansen and Johansen immediately set out for the telegraph-station, and soon the news of their arrival spread over the civilised world.

On the 17th August, Nansen arrived at Hammerfest. On

the 20th August, while still here, he received a telegram from Sverdrup announcing the arrival of the *Fram* in Norway. This filled the cup of rejoicing to overflowing. Next day the *Fram* was joined in Tromsö harbour, and again they were all together, well satisfied with their success.

We may now return to the voyage of the *Fram* after the departure of Nansen and Johansen on their sledging expedition. It then lay in 84° 4′ N. latitude, and 102° E. longitude.

Sverdrup, after carting away a great pressure-ridge from the port side of the vessel, made various preparations for a sledge-journey southward, in the event of the *Fram* being wrecked. Sledges, kayaks, snow-shoes, and many other articles had to be made, and this work kept all busy for a considerable time. Sverdrup considers Canadian snow-shoes superior to Norwegian ones, when it is a question of hauling heavily loaded sledges over rough ice.

During the summer of 1895 the drift was very slow; the latitude on 22nd June was 84° 32′, and on 6th September, 84° 43′. The longitude on these dates was 80° 58′ and 79° 52′ respectively. During the next three months the drift towards the west was much greater: on the 30th October the longitude was 70° 50′, on the 1st December it was 58° 45′, and on the 9th January 1896 it was 41° 41′. The meridian of 60° passing near Cape Fligely, in Franz-Josef Land, was passed towards the end of November. On the 15th November the latitude was 85° 55·5′, and on the 9th January 1896 it was down to 84° 57′.

In these high latitudes the change from sunlight during the whole twenty-four hours to darkness during the same period is very sudden. On 12th September the sun was above the horizon at midnight; on 8th October it disappeared at noon — a change from constant light to constant darkness in twenty-six days.

As early as the beginning of February 1896 numerous lanes of water were found both to the north and to the south. By this time they had drifted to the 25th degree of longitude, while the latitude kept steady at about 84° 50′. On the 15th February the longitude was 23° 28′, but by the 29th February they had gone back to 27°. After this date the drift to the west was very slow, but it was more rapid towards the south. On 16th May the latitude was 83° 45′, and the longitude 12° 50′.

For some months no animals had been seen, and the appearance of two bears on 28th February caused some excitement. When about 150 yards from the ship, they stood for a time, but as it was still very dark, Sverdrup waited in the expectation that they would come nearer. Instead of coming nearer, they went off. Pettersen was asked whether he had something to fry which would smell strongly, so as to entice the bears back. After the bears had been long out of sight, Pettersen produced a pan of fried butter and onions. Before long, the bears were seen coming back, and both were shot by Sverdrup. It was sixteen months since they last shot a bear, and during that time they had very little fresh meat.

Soundings were taken several times during the winter, but the bottom was not reached with a line over 9000 feet in length.

An interesting experiment was made on the 13th April. Scott-Hansen and Sverdrup took an observation with the theodolite, and Nordahl an observation with the sextant, on the natural horizon. According to the theodolite, the latitude was 84° 11·5′, and by the sextant 84° 13′. It had previously been ascertained that there was a difference of about two minutes between the artificial and natural horizons.

As spring advanced, the openings in the ice became larger, and preparations were made for forcing the *Fram*

ahead as soon as the opportunity offered. Everything that was on the ice was taken on board, and on the 18th May the engine was made ready for getting up steam.

Towards the end of May blasting operations were begun to release the *Fram* from the ice, and on 2nd June, Sverdrup and his crew had the satisfaction of seeing the ship once more free. There was still, however, too much ice all around for the *Fram* to make much use of her freedom. It was not until the 12th June that a movement could be made, and then only for a short distance. On the 27th June the *Fram* was forced ahead about 2 miles. On the 3rd July 3 miles were made, and on the 7th about 1 mile. On the 8th July, in latitude 83° 2′, the bottom was reached at 1841 fathoms. On the 19th July the *Fram* made about 10 miles, and on the following day it advanced from 83° 14′ to 82° 39′. Good progress was now made, and at midnight on the 27th July latitude 81° 32′ had been reached. During the next fortnight they made little headway, and on the 9th August the latitude was found 16′ farther north than on 27th July.

On the 13th August the *Fram* steered through the last ice-floes into open water, north of the 80th degree of latitude.

Nansen's expedition lifted the veil of mystery from a large portion of the Arctic regions. It proved that no land existed over the long zigzag route traversed by the *Fram* from the New Siberian Islands to a point north of Spitzbergen within 350 miles of the Pole, nor over the long sledge-route traversed by Nansen and Johansen. It discovered that the Polar Sea, instead of being shallow as hitherto supposed, is a deep basin, exceeding in many places 11,000 feet.

The *Fram* drifted very near the route sketched by Nansen before the expedition set out, and although

Nansen had to admit that the real force which caused the drift was the wind—an opinion previously formed by De Long from the drift of the *Jeannette*—this did not alter the final result.

The drift of the *Fram* also forcibly proves that the great mass of ice in the Polar Sea is in a constant state of movement. It was found that in the sea north of Siberia the prevailing winds were south-easterly or easterly, and therefore the drift was towards the north-west or west. On the other hand, to the north of Spitzbergen the winds are north-easterly, and the drift is to the south-west.

The manner in which the *Fram* drifted also allows speculations to be made as to the likelihood of the existence of land to the north of the *Fram's* track. It was found that with a southerly wind the ice moved easily towards the north. This is in favour of the view that no land exists within a considerable distance to the north. The depth of water and the absence of bears during 1895 also favour this view. There is a greater probability that land may exist north of Greenland or north of Grinnell Land.[1] The *Fram* began to drift to the south when it reached the neighbourhood of 66° E. longitude, or to the north of Franz-Josef Land. The latitude was then 85° 55·5′. It is probable, however, that the *Fram* was now within the direct influence of the drift which constantly passes down the east coast of Greenland, and that the drift to the south was not due to land towards the north or west. More ice is formed in the Polar Sea during the long winter than is melted during the short summer, and the surplus must find an outlet into the warmer water of the south. The ice of the Polar Sea may be compared to the ice of a mighty glacier: the surplus of both moves on until it finds an outlet, and moves in the path of least resistance.

[1] These remarks were written before the discovery of Crocker Land and Bradley Land.

The chief and almost only outlet from the Polar Sea is between Greenland and Norway. A comparatively small amount of ice finds its way through Robeson Channel or Behring Strait. The drift of the *Jeannette* proves that from Behring Strait the set of the ice is towards the west and north-west. Between the longitude of Behring Strait and the longitude of the north-east of Greenland there must somewhere be a dividing-line where it will be easier for the ice to find its way east round the north of Greenland than westward over the great extent of Polar Sea. It is probable that the ice from north of latitude 84° and westward at least as far as 100° W. longitude drifts to the east round the north of Greenland, if land does not extend farther north in that direction.

The sledge-journey by Nansen and Johansen was the most daring ever undertaken. In the case of any other sledge-journey there was always a base of supplies to fall back upon; in Nansen's case there was none. In taking only one companion with him, his daring amounted to rashness. Had any serious accident happened to one of them it would have meant the sacrifice of both lives, for it cannot be supposed for a moment that a comrade could have been deserted under any circumstances. A party of three would have been much safer, although it would have involved a larger quantity of provisions. Two men might struggle on with a disabled companion, but it would be practically impossible for one to do so.

CHART OF SVERDRUP'S DISCOVERIES.

CHAPTER XI

SVERDRUP'S EXPEDITION (1898–1902)

A FEW days after the return of the *Fram*, Sverdrup was asked by Nansen whether he wished to go on another expedition to the north. He then explained that Consul Axel Heiberg and the firm of brewers, Messrs. Ringnes Brothers, were willing to equip a new Polar expedition with Sverdrup as the leader. The offer was quickly accepted.

The route agreed upon was up Smith Sound and through Robeson Channel, and as far along the north coast of Greenland as possible before wintering. Sledge-journeys were then to be made to the northernmost point of Greenland, and as far down the east coast as could be attained.

The Norwegian Government not only gave the loan of the *Fram*, but granted about £1100 for necessary alterations.

It was intended to provision the *Fram* for two or three years, but in the end there was enough for five.

The only member of the first expedition to accompany Sverdrup was Hendriksen. The full party numbered sixteen, and included a botanist, a zoologist, and a geologist.

The *Fram* left Christiania on 24th June 1898, and on the 27th it left Christiansand, a course being set for the south of Greenland, which was sighted on the 17th July.

On 28th July a stop was made at Egedesminde, where it had been arranged that the Royal Greenland Trade Service would have dogs for the expedition. In Sverdrup's opinion the two indispensable adjuncts to the carrying out of polar research are ski and dogs, and for the Eskimo dog he has a great admiration. His experience was that one man cannot manage more than eight dogs.

Egedesminde was left on the 29th July, and next day Godhavn was reached. Here, coal, water, and more dogs were taken on board, and on the 2nd August a course was shaped for Upernavik, which was reached on the 4th.

Upernavik was left behind on the 5th August, and Melville Bay was entered on the following day. Here the *Fram* was detained six days in the ice, and did not reach open water till the 16th.

The first place visited was Foulke Fiord, where they expected to obtain large game, but were disappointed. The *Fram* was next steered for Littleton Island, where records were deposited. The view of the ice from the island was not encouraging, but Sverdrup continued along the coast of Greenland. The ice, however, lay immovable close in to land, and the *Fram* was forced to turn back on the night of 17th August.

When abreast of Littleton Island a course was steered to Ellesmere Land, and then the coast was followed northwards; but when north of Cape Sabine the *Fram* was stopped by impenetrable ice. To avoid being pressed ashore, it was found necessary to anchor the *Fram* in the northern part of Rice Strait. For some time it was hoped that the ice would drift south and allow a passage to the north, but ultimately the party were compelled to take up winter quarters in Rice Strait.

Preparations were soon made for autumn sledging through Hayes Sound, and before the winter darkness

set in it was discovered that the Sound divided into two fiords, and one of these was penetrated to its head. The valleys in this region were found to support large numbers of musk-oxen, but as Sverdrup failed to detect the flavour of musk either in the flesh or in the milk, he preferred to use the term "polar oxen."

A more or less permanent camp was formed on the point of land where Hayes Sound divides into Beitstadfiord and Jokelfiord. It received the name of "Fort Juliana." While Sverdrup was here on 6th October he met Peary, who was out on a sledge-journey. Peary's ship had passed Cape Sabine on 13th August, and on the 15th had been beset off Cape Hawks, where it had to winter.

Sverdrup's party passed the winter busily engaged in various preparations for exploration in the spring. The winter quarters were not far from Greely's starvation-camp, but little trace of it could be found.

On the 18th March 1899 an Eskimo from Inglefield Gulf on his way to Peary's ship paid the *Fram* a visit, and other Eskimo arrived during the course of the spring.

On the 19th March, when the Eskimo left the ship on his way to Peary, he was accompanied by Baumann, Sverdrup's second in command, and by Hassel, one of the crew, who wished to visit Peary. The *Windward* was reached without incident, but at that time Peary himself was confined to his cabin. In February, during a sledge-journey, most of his toes were frost-bitten, and had to be amputated.

On 17th April, Sverdrup with three men left the ship to make an attempt to cross Ellesmere Land to the west coast. Two days were taken to reach Fort Juliana, which was left on 20th April. After leaving this camp, the ice was found very favourable, and a distance of

38 miles was covered during the first day. At the head of the fiord Sverdrup decided to continue the journey with Bay the zoologist, while the other two were to make a survey from the head of the fiord back to the *Fram*.

Sverdrup's route now lay along the bed of a river, but in the afternoon of the first day rapids were met, and a halt had to be made so that the country ahead could be examined. By making a détour round the rapids, across some sand-hills, better travelling was found, and the ground up to the watershed was covered quickly.

Polar oxen were met in considerable numbers. When attacked, they form a square with the calves and heifers in the middle, and the bulls and cows standing in line of defence at equal distances. Sometimes the fiercest of the bulls form a kind of outpost about 25 yards distant from the square, and make individual attacks. When once the square has been formed, the animals remain at their posts until the attack is repulsed or the entire square fallen. They have developed their strategic reasoning powers to a wonderful extent.

West of the watershed the country became bare of snow, and progress was arrested by an impassable cañon. After various endeavours to find a passage for the sledges, Sverdrup decided to carry provisions for three days, and to take the dogs loose. In two days they reached a large fiord, which was named "Bay Fiord" after Sverdrup's companion. The return journey was made without special incident.

On 23rd May, Isachsen, the cartographer of the expedition, with Braskerud, set out to cross the glaciated part of Ellesmere Land. The west coast was reached on 4th June. They found considerable difficulty on many occasions in extricating themselves and the dogs from the crevasses in the glaciers, but the journey was com-

pleted without serious accident. They reached the *Fram* on 2nd July.

On the 2nd June two expeditions left the ship. One was composed of Schei the geologist, and the doctor, Johan Svendsen. The other was composed of Simmons the botanist and Sverdrup. Both parties travelled together during the first day, and then separated. On the 6th June, Sverdrup and his companion were at Fort Juliana, when the other party unexpectedly arrived. The doctor had taken ill while driving up the fiord. He was made as comfortable as circumstances would allow. He was snow-blind, and also complained of pains in his chest. Sverdrup wished to take him back to the *Fram*, but he said he would soon get well, and he preferred to stay where he was. Two days afterwards the doctor was much better, and helped to harness the dogs and lash the loads when the rest of the party were setting out on a four-days' trip to Beitstadfiord. The doctor said he would stay behind at Fort Juliana and employ his time in collecting insects and in shooting. They then parted, little thinking what was about to happen. On their return to camp they were horrified to find the doctor dead. The body was removed to the *Fram*, and then received a seaman's funeral in Rice Strait. The doctor's death was a great blow to the whole party, and some of the strongest did not recover from it until months afterwards.

During July the dépôt at Fort Juliana was withdrawn, and preparations were made to sail north. An attempt was made on the 24th July, but the *Fram* could not get beyond Pim Island. Next day, in order to avoid the pressure of the pack, the ship had to retreat to its winter harbour.

On 4th August another attempt was made to proceed north. Things went well until the *Fram* was abreast of

Cape Camperdown, but here the ice compelled them to steer a course more and more to the east. While in this position, a steamer was seen to issue from Payer Harbour. Sverdrup at once came to the conclusion that it was looking for Peary, and would probably have letters from Norway. An attempt was made to meet each other, but they could not get nearer than about 5 miles. Then the American ship signalled that she had letters on board for Sverdrup, and steered off southward. The farthest point reached by the *Fram* was about abreast of Cape Hawks. Here she lay in the ice several days, and at last got free only a few miles north of Cape Sabine.

Sverdrup now decided to go across to Foulke Fiord. There one of Peary's ships was found, and it was ascertained that the Norwegian mail had been left at Payer Harbour.

Foulke Fiord was left on 12th August, and a course was steered for Payer Harbour to fetch the mail. It was soon seen, however, that it was impossible to reach it through such masses of ice as were encountered. A course was tried farther south, but with no better result. Then several attempts were made along the Greenland side, and across towards Payer Harbour, but each ended in failure.

After a good deal of deliberation, it was finally decided to make for Jones Sound. It was a great disappointment that they were unable to proceed through Kane Basin towards the north of Greenland; and the failure to reach their letters very much depressed the spirits of the party.

A course was now set for the walrus-shoals off Northumberland Island, where twenty-two of the animals were killed to serve as dog-food during the winter.

Jones Sound was entered on 24th August. A place of anchorage was found in a fiord a little west of Cone

Island. It was afterwards named "Fram Fiord." On the night of 28th August this fiord was left, and the *Fram* proceeded west as far as Havnefiord, where a winter harbour was secured.

After various short trips, Sverdrup with three men set out on 8th September to put down dépôts of dog-food as far west as possible, so as to be prepared for long journeys. The water was still open, and the party went by boat. On the 10th they reached a fiord, afterwards named "Baadsfiord," and they formed a dépôt on its eastern side. They now decided to return to the ship, but found it impossible to row the boat through a thick layer of snow and slush which had formed on the surface of the water.

When they saw that there was little chance of being able to take the boat back to the ship, and that they must wait until ice formed strong enough to allow them to walk back, they set to work to make a house, with the boat for a roof. A hole was dug in a mound, and the boat put on the top with shingle along the sides, and over the whole was put a layer of snow 2 feet deep.

On 6th October the ice was strong enough to bear, and a start was made for the *Fram*. On the way they met a relief party from the ship, and learned that Braskerud was dead. He had caught a bad cold in Jones Sound, and had been ill two weeks with a cough and great difficulty in breathing. It is probable that both he and the doctor had suffered from pneumonia.

The time for the autumn sledge-journeys had now arrived, and it was Sverdrup's intention to make a dépôt at as great a distance to the west as possible. Various preparations had to be made, but these were completed in time to let Sverdrup with five men set out on 13th October. During this trip a double tent was made use of for the first time, and proved very successful. The inner tent was made of thin cotton lining material,

There was a space of about a foot in height between the two tents, and a space of 3 or 4 inches between the vertical walls.

Two days were spent in the house at Baadsfiord, from which they again set out on 18th October. On the 19th they were stopped by open water beyond Stormkap, and here formed a dépôt in which was also placed the most of the meat from two bears which had been shot on the way. In returning they explored a large fiord between Baadsfiord and Stormkap, where they shot twenty-six polar oxen. The fiord received the appropriate name of "Moskusfiord." It was a large task to carry all the meat to the ship, but after several trips it was completed by the 18th of November.

In Sverdrup's opinion, Eskimo dogs should be fed once every day. He believes that if well fed and protected from cold in suitable kennels there is no reason why so many should die during the winter. He found his dogs in full vigour even at the darkest period of the year.

The winter passed in making preparations for the spring journeys. On the 23rd February 1900 four men set out for the westernmost dépôt, where they were to leave their loads. When they reached it they found it destroyed by bears, and nearly the whole of the food eaten. Sverdrup now decided that a man should remain at the dépôt as long as any sledge-parties were travelling west of it. Bay at once applied for the post, and was appointed "Commandant of Bjorneborg." Here he lived alone for three months.

On the 20th March the great spring expedition started off. On the 17th a party of four had left for the dépôt. The larger party consisted of six men, who were ultimately to form three parties of two men each. The dogs numbered fifty-five. The provisions consisted of bread, butter, sugar, coffee, chocolate, pea-soup, vegetables, figs, French

plums, raisins, nectarines, egg-powder, groats, potatoes, meat-fat, pemmican, golden syrup, and fish-flour. The dietary allowed each man per day weighed $2\frac{1}{5}$ lb. The loads amounted to over 670 lb. each.

At Bjorneborg the provisions for the different parties were weighed and arranged, and then a start was made westward. The first fiord west of Bjorneborg was named Gaasefiord, from the number of geese found in it. When crossing the second fiord, three walruses were shot, and after feeding the dogs well, the remainder was left as a dépôt of dog-food. This fiord was named "Hvalrosfiord," or "Walrus Fiord." Next day they reached a sound where huge masses of ice were grinding round in a tearing current. Sverdrup had never seen waters so absolutely impossible to navigate as he saw here. The difficulties which had to be overcome before it could be passed were so great that it received the name of "Helvedesporten," or "Hell Gate." On one occasion three men, eighteen dogs, and three sledges with their loads fell into a hole in the snow 12 feet deep, but by great good fortune no serious damage was done. On another occasion one of the sledges slipped over a wall of ice into the sea. The dogs would have been carried with it, but the traces broke. One of the men, with a rope round his waist, had to be lowered down, and the load and sledge were ultimately hauled up.

The land at last began to trend to the north-east, and the point was named "Land's End." The whole of the west coast of Ellesmere Land was subsequently called "King Oscar Land." Next day a high mountain crag appeared above the horizon away to the north. It was named "Store Bjornekap," or "Great Bear Cape." Still farther to the north another cape appeared, and was named "Little Bjornekap," or "Little Bear Cape." Near here a bear was shot, and served as a good feed for the dogs.

On the 31st March the returning party retraced their steps. Sverdrup with three others proceeded westward. At the parting a bottle of brandy was produced, but somewhat to their astonishment they found it solid, and it had to be poked from the bottle with a stick. The temperature was 44° below zero.

The party now met loose snow, and during the first day made only 9 miles; during the second day only 8 miles were covered. In the evening of the second day they fortunately killed a bear, and decided to camp for a day or two while the meat lasted, in the hope of the travelling and weather improving. On this and many other occasions the liver of the bear was offered to the dogs, but they will touch it only when excessively hungry. It has been a common belief that the bear's liver is poisonous to both men and dogs, but Sverdrup has eaten it many times without feeling any disagreeable consequences. He never found it in the least unpalatable when care had been taken to remove the gall-bag as quickly as possible. The last of the bear-meat was consumed on the 7th April, and next day a fresh start was made. A high mountain in the west had been visible for some time, and Sverdrup formed the opinion that it was not part of Ellesmere Land. He thought that a sound probably passed north between Ellesmere Land and this new land, and later exploration proved that this opinion was correct. The high headland received the name of "Cape Sydvest," or "Cape South-West."

Beyond the headland bare ice was met, and travelling became much faster. On 16th April, while Sverdrup was standing on a pressure-ridge scanning the country, he suddenly became aware that he was looking at land far away in the west. A new plan was at once formed: Isachsen with Hassel were to visit the new land in the

west, while Sverdrup and Fosheim were to continue to the north along what was afterwards named "Axel Heiberg Land."

Isachsen decided to leave behind a small dépôt where he was to place a letter on his return. During the first day Sverdrup and Fosheim covered 18 miles. Next day they had strong wind and drift, and as a consequence went out of their course and found themselves far inland among some sand-hills, and all the time they had thought they were driving on the sea-ice. A little farther to the north they experienced very severe weather, and were compelled to remain at one camp five days.

On the 2nd May they found themselves in latitude 80° 31½′, and the coast was trending due north. The tracks of reindeer were seen on several occasions, but not the animals themselves. There was now no extra food for the dogs, and it became evident that their strength was failing. The latitude of 80° 55′ was reached on 5th May, and here they decided to erect a cairn and then return. It is remarkable that along the whole of this coast Sverdrup saw nothing approaching to palæocrystic ice.

As food was getting short, the return journey had to be made with all possible speed. A short record was found from Isachsen, who had returned to his dépôt on 28th April. Sverdrup and Fosheim reached it on 16th May. Before they arrived at Land's End, a bear was shot, and was much needed for the dogs. As had been prearranged, Baumann left a record in a cairn, with a description and sketch-map of a passage across the land to Goose Fiord. Sverdrup attempted this passage, but in foggy weather he missed the way, and found himself suddenly stopped by a high wall of ice, which entirely cut off the valley. On investigation, however, a tunnel made by a river was found to lead into the glacier.

Rather than drive all the way back, it was decided to try the tunnel. From the roof hung gigantic blocks of ice, and along the walls were grotto after grotto. It was a fairy scene, but fear-inspiring as well as beautiful. The tunnel led through to the valley on the other side. The remainder of the journey to Bjorneborg was made without incident.

Bay had now been a hermit three months, and had many adventures with bears to relate. Sverdrup took him on to the ship, and left Fosheim at Bjorneborg in Bay's place.

Before Sverdrup reached the ship a serious fire had taken place on 27th May. A spark from the galley chimney is supposed to have set the winter-awning on fire. The flames spread so rapidly that soon the rigging was on fire, sixteen paraffin-prepared kayaks which were lying under the awning were totally destroyed, as well as a score of prepared polar-ox skins and some bear-skins. Several cases of powder were removed at the last moment. An iron tank containing 50 gallons of spirit could not be moved, but although the heat melted the tinning on the outside of the tank, the spirit did not catch fire.

Schei and Peder arrived from their journey on Whitsunday morning. They had visited North Kent, where they shot some reindeer; and then went to Buckingham Island and Graham Island. From there they had visited some fiords in the south of Axel Heiberg Land.

Isachsen and Hassel returned on board on 19th June. On 16th April they separated from Sverdrup and Fosheim to explore the land seen in the west. The weather was foggy, and nothing was seen of the land till the 20th April, when they found themselves near the ice-foot. After getting a general view of the land, they returned to Axel Heiberg Land, where they arrived on 28th April, and left a record as arranged. They then travelled south

round Cape South-West, and visited some of the fiords in the south-east. The summer was spent in shooting, dredging, botanising, and in making short trips to places not far from the ship.

On the 8th August the *Fram* was able to steam out of its winter harbour and make its way westward. At the termination of Jones Sound, Cardigan Strait was entered and the north end reached; but here fast ice was met. The *Fram*, however, was able to bore its way some distance to the west, but was finally stopped by the ice and drifted back. Later, the *Fram* became beset, and was not liberated till the 15th September. Next day they were due west of Graham Island. A course was now steered for Jones Sound, and a winter harbour was found in Goose Fiord. The valleys in this neighbourhood were well stocked with game, and large numbers of polar oxen were shot for food during the winter.

On the 18th October, Sverdrup and Olsen left the ship, equipped for ten days. They were to make an attempt to discover a sound leading north towards Greely Fiord. The following day, a terrific gale came on, and while sledging, a gust of wind carried Olsen's sledge with such violence against a block of ice that Olsen was shot several yards, and came down on his shoulder. Olsen thought his arm was dislocated, but Sverdrup hoped it would soon get right again, and pushed on. The arm, however, became more and more painful, and they were forced to turn back. The wind and drift were now in their faces, and Olsen's sufferings became very acute. They had passed the previous night at a camp with Baumann and the mate, who were out shooting, and to this they returned. Olsen was put into the tent, his clothes taken off, and his arm examined. His companions felt sure that the shoulder was dislocated, but all their attempts to put it in again were unavailing.

During the night Olsen had no sleep, and next day the storm was so violent that no move could be made. On the following day the storm had abated, and Olsen was taken back to the ship. As soon as Sverdrup arrived on board, some of the doctor's books were searched to find out what was to be done with Olsen's shoulder. Sverdrup did not dare to give chloroform, but as the arm was now extremely painful he decided to make Olsen drunk with brandy. After the patient had taken about half a bottle, an attempt was made by Fosheim and Simmons to reduce the dislocation, but they failed. Then Sverdrup and Fosheim tried, and to their great relief the arm slipped into its socket. Olsen stood the ordeal well. The pain and excitement had kept him sober, but as soon as the dislocation was put right he became dead drunk. Next day he was quite himself again.

Winter preparations, such as covering the skylights and making kennels for the dogs, were now carried out, and various kinds of work in preparation for spring were started. New sledges, odometers, and sleeping-bags had to be made; and many articles required repairs. Schei was set the task of making a new travelling-camera, and did it successfully.

Wolves made their appearance during the winter, and two were caught in a trap, and ultimately grew quite tame.

On the 8th April 1901 the long spring journeys started. Sverdrup and Schei were to investigate whether the new land discovered during the previous year was separate from Ellesmere Land. Isachsen and Hassel were to explore the land in the west. The latter party had formed a dépôt at Cape South-West earlier in the spring, and Sverdrup had also formed a dépôt. Baumann and Stolz were to carry out a surveying expedition.

Sverdrup first explored several of the fiords which run

northward from Baumann Fiord. From Troldfiord they passed over the land, and reached a large fiord running east and west. A course was made for the north-west point, from which a waterway was seen extending northward as far as the eye could reach. To this was given the name of "Heureka Sound." In the north was seen a high, bluish-black, precipitous promontory, which was called "Blaamander," or "The Blue Man," and the course was set on this. Farther north it was decided that Fosheim and the mate, who were still with Sverdrup, should follow the east side of the sound, while Sverdrup and Schei should follow the west side. From this point, far to the north, rose a mountain crag which appeared like an island. It was later found that it was not an island, but that large fiords penetrated the land towards the north and east. From there, Greely Fiord runs north-east.

Sverdrup and Schei now made for the west coast, which they followed northward over rough ice and in bad weather. They finally reached a point which was termed "Smorgrautberget." From here they received the impression that a large sea opened out to the north-west, and that Axel Heiberg Land was separated from Grant Land by a sound which was named "Fridtjof Nansen Sound."

On 13th May the return journey was begun. Not far south of the most northern point reached they found Eskimo ruins. Near Blaamander they crossed to the east coast. On the journey north, and also on the way south, they encountered wolves. A pack of twelve attacked a dog-team, and one of the dogs was severely bitten before the wolves were driven off. On the return journey several fiords were explored and examined geologically by Schei, who was always on the look-out for fossils. The *Fram* was reached on 18th June.

Baumann and Stolz had returned on 28th May, Isachsen and Hassel on 6th June, and Fosheim and the mate on 13th June.

The first two had seen a herd of three deer, and had shot a good many polar oxen, a bear with two cubs, and two wolves. They surveyed a large tract in the neighbourhood of Baumann Fiord.

After leaving Sverdrup, Fosheim and the mate made for Greely Fiord, which they followed eastwards in order to ascertain whether a fiord or sound cut into the land in a southerly direction. It was thought possible that such a fiord might communicate with Bay Fiord.

One running to the south was found, and followed to its head. Instead of going back the long way they had come, an attempt was made to cross the land to Heureka Sound, but after driving nearly 12 miles they found the way impassable, and had to return. Part of the Bay Fiord was explored on the way south, and then they shaped their course for the *Fram*.

Isachsen and Hassel reached Cape South-West on their outward journey on 13th April. They found the cache scattered about in all directions, but little of the food was missing. It was supposed that this had been the work of polar oxen.

They left Cape South-West on 14th April with loads of about 550 lb. on each sledge, and reached the new land on the 17th. A sound was discovered between the new land and North Cornwall, which was already known. It received the name of "Hendriksen's Sound." They passed through this sound, and reached the south-west point of what was afterwards named "Amund Ringnes Land," and followed the coast northward. On the 23rd April land was seen in the west and south-west, and they decided to drive west. They arrived next day at Nathorst Peninsula, and this new land received the name of "Ellef

Ringnes Land." The sound between this and the land they had left was named after Hassel. Towards the west and south-west still another land was seen, and was called "King Christian's Land." The sound between the two latter was called "Danish Sound," and they passed through this and drove north. At the most northern point of the land, the trend began to be east and then south. They followed the coast-line until 20th May, when they saw land in the east, which proved to be "Amund Ringnes Land," the northern point of which they reached on 24th May. They then made for Axel Heiberg Land, and reached Cape South-West on 29th May.

On the new land they had explored they saw reindeer and ptarmigan, and the tracks of bears, foxes, wolves, and hares. They reached the *Fram* on 6th June.

The summer work was now commenced, such as dredging and botanising, and a trip was made to North Devon.

As summer advanced, the party became anxious about the prospects of the *Fram* getting free from Gassefiord, as it was intended to return to Norway that year. An attempt was made to bore the ice on 12th August, but it ended in failure. On the 26th the *Fram* advanced a thousand yards, but on the 27th it could only make three ship's lengths. By 5th September the ship had gone about 10 miles through the ice, but some 6 miles of ice was still between it and the open water. They had now to give up all hope of getting free that year, and had to make preparations to spend their fourth polar night.

Again the winter was passed in hard work for the coming spring. It was intended, in case a ship might come into Jones Sound in search of the *Fram*, to build cairns and leave a record of the expedition on Cone

Island, and on different points in the sound. It was also intended to send a sledge-expedition to Beechy Island, partly to correct their chronometers, and partly to look at the dépôts left there half a century before. Schei and Sverdrup were to go north and map the tracts west of Greely Fiord.

On 1st April 1902 three parties went off. The patent dog-food was nearly finished, and they had to carry stock-fish instead, which weighed much heavier. Trusting to being able to obtain bears, Sverdrup did not take blubber nor meat. No bears were obtained when expected, and the dogs soon became very weak. It was not until the 16th April that a bear was seen and shot.

Instead of travelling over the heavy ice towards Smorgrautberget, Sverdrup kept to the east shore, and then steered straight across Greely Fiord to Blaafjeld, in the south of Grant Land. They kept to the east side of a pressure-ridge which stretched straight across the fiord, and seemed to be the boundary between the fast ice of the previous year on Greely Fiord and the drift-ice outside.

When near land, the ice became heavy, and it was with great difficulty that advance could be made. West of Blaafjeld they passed into a fiord where a large number of hares were seen. It was the pairing season, and they were scampering about in all directions. Sverdrup supposed they had lost their heads from love, and he slyly remarks that this is a thing which may happen to others besides hares. The fiord was named "Harefiord."

On 30th April they set off from the headland on the west side of the fiord. In the evening they camped near the most westerly foreland they had seen the previous year from Smorgrautberget. Next day they reached another fiord and entered it for a short distance, but

as they were anxious to ascertain the extent of land to the west they did not venture to its head. Next day the land trended about due north, and when the weather cleared land was seen to the north-west, and they recognised they were in a bay. A straight line was made for the part farthest off, which was reached on the 6th May. Sverdrup here ascended a height, and found that he was on an island separated by a narrow sound from the land in the east. From a point about 3 miles north of the camp, the land turned to the north-east. North and west of this land, only sea could be made out. To the south was Axel Heiberg Land. Sverdrup built a cairn to mark their farthest north, as he had now decided to return. The latitude was found to be 81° 40′.

In returning, a course was made across Fridtjof Nansen Sound to the northern extremity of Axel Heiberg Land. In passing south they proved that Schei Island was really an island, and not a peninsula. Some polar oxen were shot and the dogs feasted, and the way south was covered at a good speed. When Bay Fiord was reached, they entered it and explored it to its head, where they arrived on 29th May.

The *Fram* was reached on 16th June, after an absence of seventy-seven days.

Isachsen, Fosheim, and Hassel had left the records as arranged, and had returned to the ship on 18th April; and on the 23rd April, Baumann, Fosheim, and Raanes started for Beechy Island, which was reached on 4th May. It is really not an island, but constitutes the south-west corner of North Devon. The dépôt was found destroyed. The cutter *Mary*, which had been left there, was a wreck; whether the work of Eskimo or seal-catchers could not be said with certainty. They discovered that Arthur Strait was really a fiord. The

return journey was started on the 6th May, and the *Fram* was reached on the 20th May.

On the 12th April, Isachsen and Bay made a trip to North Devon, and did not return till 21st May. On 25th May, Isachsen and Simmons set out to examine a bed of coal discovered by Baumann, and returned on 9th June.

The work of exploration was now over. The usual summer dredging was begun, and the geologist hunted for fossils. Olsen managed to fall from a pressure-ridge and dislocate his other shoulder. This time it was reduced without the assistance of brandy.

On 20th July the *Fram*, with steam up, began to leave her winter harbour, but it was not until the 6th August that she entered Jones Sound. On the 10th the *Fram* was in Baffin's Bay, heading for the Devil's Thumb. Godhavn was reached on the 17th August, and here they were well received. They left on the 21st, and although there was a break-down of the engine, Norway was sighted on 18th September. Stavanger was reached on the 19th, and soon they received a most enthusiastic reception wherever they went. The owners of the expedition incurred expenses to the amount of £12,014.

This expedition, although it unfortunately was prevented from carrying out its original plans, did important work. It not only explored the whole of Jones Sound, but discovered the existence of large islands extending toward the north. The fact that no palæocrystic ice was met with in this region makes it highly probable that land exists still farther to the north.[1]

[1] The discovery of Crocker Land and Bradley Land proves that this view was correct.

CHAPTER XII

ITALIAN EXPEDITION (1899–1900)

Between the discovery of Franz-Josef Land by the Austro-Hungarian Expedition and the expedition of the Duke of the Abruzzi a good deal of exploration had taken place. In 1880 and 1881, Leigh Smith in his yacht *Eira* reached Franz-Josef Land without much difficulty, and surveyed the coast up to Cape Lofley. The *Eira*, when leaving for the second time, was crushed by the ice near Cape Flora, and sank. The crew built a wretched hovel in which they passed the winter. In the following summer they sailed in their boats to Novaya Zemlya, where they were taken on board a ship which had been sent to their assistance.

In 1894, Jackson, in the *Windward*, built a station at Cape Flora, on Northbrook Island, and remained there till the autumn of 1897. He made three expeditions with sledges. In the first two he was prevented from advancing towards the north by stretches of open sea. He reached 81° 20′. In the third journey he went towards the west, making the circuit of Alexander Land. He named the most westerly point of the group "Cape Mary Harmsworth." The sea to the north was called "Queen Victoria Sea."

In 1898, Wellman in the *Fridtjof* landed at Cape Tegethoff, and after making some discoveries in the eastern part of Franz-Josef Land, returned home next year in the *Capella*.

The Duke of the Abruzzi left Christiania on board the *Polar Star* on 12th June 1899. It was his intention to proceed to Emperor Franz-Josef Land and attempt from there to reach the North Pole.

The expedition was composed of eleven Italians and nine Norwegians. The ship was a whaler, and had been previously named the *Jason*. It had been commanded by Captain Evensen, who retained the command by being appointed captain of the *Polar Star*.

The second in command of the expedition was Umberto Cagni, captain in the Italian Navy.

Archangel was reached on 30th June. Here 121 dogs were obtained. They had been brought by Trontheim, who was also employed by Nansen.

Archangel was left on 13th July; the first ice was met on the 17th, and Northbrook Island was sighted on the 20th July.

The five huts left by Jackson at Cape Flora were visited, and a dépôt of provisions for eight months was landed, in addition to five tons of coal.

Cape Flora was left on 26th July, and an attempt was made to pass to the north through Nightingale Sound, but the passage was blocked by ice. Next an attempt was made to double Cape Mary Harmsworth, but this also ended in failure.

Nightingale Sound was again entered on the 28th July, but in the evening of this day the ship was surrounded by ice-fields, and had to remain near the northern extremity of Bruce Island three days. On the 1st August an attempt was made to bore the ice, but the ship advanced only about 300 yards. Some channels formed on the 3rd and allowed some progress. On the 5th the whaler *Capella*, with Wellman's party, was sighted near Scott Keltie Island, and Wellman and three of his companions visited the ship.

From this point the *Polar Star* had open water until it reached Maria-Elizabeth Island, but here it was stopped by thick ice ahead and foggy weather. When the fog cleared, a passage was found to the east of the island, and the *Polar Star* advanced rapidly northwards, and reached 82° 4′ to the north-west of Prince Rudolf Island. The *Alert* reached 82° 27′, the *Polaris* attained 82° 11′, so that the *Polar Star* took third place among the ships which had been navigated towards the Pole. The *Fram* reached a much higher latitude, but it was by means of the drift. From the farthest north reached by the *Polar Star* the horizon was carefully observed, but no trace could be found of Petermann Land and King Oscar Land, which Payer thought he sighted from Cape Fligely. It was found that the latitude of this cape was 81° 50′ 43″, and not 82° 5′, as given by Payer.

The *Polar Star* was now steered towards the south-east to Teplitz Bay, the most northern bay of Franz-Josef Land, in latitude 81° 47′, where it went into winter quarters. The bay did not provide a very safe anchorage, but its position far to the north made it of great importance for the contemplated sledge-expeditions.

On the 27th August the *Polar Star* was driven by the pressure of the ice against the ice fixed to the coast, and heeled over about 13 degrees. When the pressure ceased, she remained in the same position. On the 7th September the ice-pressure again became severe, and the ship was so seriously damaged that it had to be abandoned.

Steps were at once taken to have the stores landed, and two large field-tents were erected on the shore to serve as winter quarters. Outside these a second tent was formed to cover the two field-tents, and a third tent covered the whole.

A space between the two inner field-tents was occupied

on one side by the kitchen, and on the other by bags and cases containing clothing. Between the field-tents and the second tent tins of milk were built in the form of a wall, and between the second and third tents were stored the provisions likely to be consumed during the winter.

After all these preparations had been completed, an attempt was made to repair the damaged ship, which still kept its position heeled over in the ice. The water which had leaked into the ship was pumped out, and as far as possible the damaged parts were repaired with tarpaulin and boards.

During the winter preparations were made for the long sledge-journey in the spring. On the 23rd December the Duke of the Abruzzi went out with some of his party in order to train the dogs to draw sledges. They drove to the bottom of the bay, and then turned back. On the return journey a storm came on, and the way was lost. Instead of keeping on the ice of the bay, they wandered unknowingly up on the island, and were only made aware of the fact when two sledges with their dogs, as well as the Duke and Captain Cagni, fell from the glacier down to the bay, a height of some 23 feet. Fortunately, neither was hurt. Owing to the drifting snow and the darkness, great difficulty was experienced in regaining the tent. When it was reached, it was found that several of the party were frost-bitten. The Duke and Captain Cagni had suffered most. The circulation in the terminal joints of two of the Duke's fingers of the left hand could not be restored.

Christmas and the beginning of the New Year were celebrated with the utmost enthusiasm. Fireworks consisting of rockets and fiery fountains, salutes from the small gun, and bonfires of wood steeped in petroleum, all united to form a striking scene in a land far removed from civilisation.

With the beginning of the New Year the preparations for the sledge-journey received most attention. The daily ration was fixed at 2 lb. 12 oz. 9 dr., which was about 3 oz. more than the weight used by Nares and Greely. It consisted of biscuit, tinned meat, pemmican, butter, milk, Liebig's extract, desiccated vegetables, Italian paste, sugar, salt, coffee, tea, and onions.

The lamps used were made on the Primus system, and the cooking-stove was that designed by Nansen. The quantity of petroleum was fixed at 3 oz. 8 dr. for each man daily. The dog's ration of pemmican was 1 lb. 1 oz. 10 dr.

The expedition carried flat-bottomed kayaks. These had a framework of thin rods over which canvas was stretched. Their greatest length was 11 ft. 7 in., their width 2 ft. 6 in., and their height 11 in. They were provided with a small sail, a pump to empty out water, and a pair of oars with their rowlocks.

The sledges were 11 ft. 5 in. long, 1 ft. 6 in. wide, and 6½ inches high. The runners were slightly convex, so as to turn easily; they were shod with white metal, and wooden runners were strapped beneath them. The foremost ends of the runners were joined by a bow, to which the trace was attached, and no nails were used. Each sledge was provided with a small steel rope, with as many rings as there were dogs to tie them to, at a distance of 4½ feet from each other.

On 18th January 1900 the Duke had nearly all the first joint of the middle finger of his left hand amputated, and ten days later a part of the fourth finger. This rendered him quite unable to take any part in the sledge-expedition, and Captain Cagni was given the command of it.

This expedition set out on 19th February. As open water reached the mouth of the bay, it was found necessary

to haul the sledges overland to a point north of Cape Germania. With thirteen sledges drawn by 108 dogs, the ice-pack was reached on the 21st February. During the first night on the ice the temperature reached 45·4° F. below zero, and on 23rd February it reached 61·6° F. below zero. Many of the party were frost-bitten, and few could sleep. This extreme temperature was more than they could stand, and Captain Cagni wisely decided to return to Teplitz Bay, which was reached on the night of the 23rd.

The expedition left again on the 11th March. During the interval various alterations had been made. It was found necessary to diminish the loads so as to avoid damage to the sledges when crossing the broken and difficult ice near the island. The allowance of petroleum was increased to 6 oz. 5 dr. for each man. Cagni had also observed that it would be necessary to always send forward at least two men to prepare the way for the sledges. He therefore decided to take an additional man.

The expedition consisted of three detachments. One was composed of four men, and the other two of three men each. The four men were to accompany the party twelve days, and then return. The provisions were so divided that this party carried the whole of the rations for the ten men during the twelve days, and also the rations for their own return. The second detachment carried the rations to last the remainder other twelve days and their own return. According to this arrangement, the third or advance party would not begin on their own rations until the twenty-fifth day, when the second detachment would return.

The entire camp equipment and the clothing for the three detachments amounted to 978 lb. 13 oz. 8 dr., or nearly 100 lb. per man. The weight to be carried amounted to the remarkable total of 6718 lb. 9 oz. 13 dr.,

or almost exactly 3 tons. Twelve sledges were used, so that the average weight for each was 5 cwt. The dogs numbered 103.

On the second departure the expedition was able to travel out of the bay without having first to drag the sledges overland. On the first day the temperature was 27·4° F. below zero. An auxiliary detachment accompanied the party two days.

At first, Captain Cagni set out towards the west, so as to get away from land, but on the second day he tended a little east of north, so as to allow for the probable drift towards the west. During the night of the 13th March the temperature fell to 45·4° F. below zero. On the 12th an advance of 7 miles was made; on the 13th, about 10 miles; but on the 14th the ice-axes had frequently to be used to make a road, and only 3½ miles were covered.

For some days the temperature kept remarkably low. On the morning of the 16th it reached 58° F. below zero. On the 19th it rose to 16·6° F. below zero, but on the 21st it again fell to 36·4° F. below zero.

On the 21st March, Cagni decided to take three men with him in the third or advance detachment. He found it necessary to send two men forward to prepare the way for the sledges. With three men in the detachment, only one would be left to look after the most of the dogs and sledges. He therefore decided to send back three men in the first detachment, instead of four. To meet the extra rations required for the additional man, he intended to send back the first detachment two days, and the second detachment four days earlier than originally intended.

The first detachment, composed of Lieutenant Querini, the guide Ollier, and the engineer Stökken, was sent back on the 23rd March. At this time the expedition was

about 45 miles distant from the island which had been seen two days previously. Nothing more was ever heard of this detachment. The Duke came to the conclusion that an accident must have happened. It is quite possible, however, if not probable, that the party was drifted so far out of the proper course that the island could not be reached before all the food had been consumed. It will be seen that the third detachment failed to make headway against this drift, and was saved only by giving up the attempt to reach Prince Rudolf Island, and by making its way towards the islands in the south.

Some of the dogs caused a great deal of trouble. One had deserted on two occasions. It was a fine, strong animal, and it would have been a pity to kill it. The doctor undertook to tame it and prevent it deserting. He secured it with two chains and a steel-wire rope. In spite of this, it was found trying to escape, and the doctor gave it a severe beating. During the night the dog broke the two chains, and in some incredible way managed to get free. As if to be revenged on its tamer, it made a hole in the doctor's tent and stole all the butter which was to serve for the detachment's breakfast.

Towards the end of March the temperature was still very low, and Captain Cagni suffered greatly from one of his forefingers which had already been twice frost-bitten. The sleeping-bag slowly filled with snow formed by the frozen moisture of the breath. During the night their bodies gradually thawed this snow, and they rose in a cold bath in the morning. Soon after getting up, the moisture froze again into a mass of ice. On 27th and 28th March the temperature was more than 40° F. below zero.

On the 28th March, Captain Cagni was able to take an observation for latitude, and was astonished to find that it was only 83°. He had calculated that it ought to be

about 83° 50′. The drift to the south must therefore have been considerable.

On 31st March the second detachment, composed of Dr. Cavalli, Cardenti, and Savoie, was sent back. It received rations for eighteen days, and had twenty-four dogs. Considerable difficulties were met with on the return journey, but the detachment reached the coast of the island on the 17th April. Here a broad channel of water prevented them from reaching land. A kayak was repaired, and Cardenti was sent in it across the channel. He reached the glacier face, but it took him two hours to ascend to the top by making steps with his ice-axe in a crevasse. He then was unable to find his way to the tent in Teplitz Bay. After wandering about on the island all night, he saw the tent when daylight dawned. A boat was at once dispatched to bring the doctor and his companion.

Meanwhile the party in Teplitz Bay had been anxiously awaiting the arrival of the first detachment. When the second arrived and reported that the first had left seven days before them, all hope was practically given up, although a relief party was sent out to make a search in the neighbourhood of the islands discovered by Nansen.

Cagni and his three companions set out after the departure of the second detachment. They had forty-nine dogs and six sledges. The load on each sledge varied from 440 to 485 lb. On the first day they made a splendid march of about 18 miles. With the beginning of April the temperature rose, and life became less miserable, but the higher temperature was accompanied by a strong wind. On the 3rd and 4th April this high wind and snow-drift confined the party to their tent. They set out again on the 5th, but found great movement going on in the ice. Channels were constantly opening and closing, and pressure-ridges were being

formed all around. One of the sledges broke through the ice, and was dragged out with difficulty.

It was part of the scheme of the expedition to gradually kill a certain number of the dogs in order to assist in feeding the others. At first none of the dogs cared to eat the flesh ; later the few which ate it waited till it was frozen ; but ultimately the whole of the survivors devoured it with even more greediness than pemmican, and while it was still warm.

On the 7th April the latitude was found to be 83° 54′. This was near the latitude calculated by Cagni, so that the drift to the south had almost ceased. The recent tracks of two bears were seen on this date. On the 8th April channels were crossed by means of bridges built of large blocks of ice detached from the hummocks.

Cagni was still suffering greatly from his frost-bitten forefinger, which the doctor had generously promised to amputate when Cagni returned to Teplitz Bay. On the 12th April a huge pressure-ridge, which Cagni estimated to be from 36 to 45 feet in height, was seen to form about 100 yards from the camp. On this day they travelled a distance estimated at 22 miles. Next day one of the guides suddenly broke through the ice, and would have been lost but for the assistance of his companion. Cagni took half a bath shortly afterwards, and the second guide slipped into the water with one leg. In spite of these difficulties, the day's march was reckoned at 13 miles. These two days, however, greatly exhausted the dogs, and on the following day only 5 miles were covered.

On the 15th April a snowstorm confined them to the tent. Cagni's finger had kept him awake two nights, and he took advantage of the delay to unbandage it and remove with forceps some of the dead flesh. On this day a hole was burnt through one of the two saucepans. This

was looked upon as a serious accident, but it occurred to one of the guides to use the cover as a second bottom, and this fortunately answered fairly well. The storm lasted till the afternoon of the 17th April. This was the date originally fixed for the return, but Cagni decided to still push on. At midday on the 21st April the latitude was found to be 85° 29′. This gave great encouragement, and determined Cagni to make an effort to break Nansen's record. On the 22nd the latitude was 85° 48′; on the 23rd it was 86° 4′; and on the 24th it was 86° 18′.

Cagni had now beaten Nansen's record of 86° 14′, but he decided to still push on. About six o'clock they were stopped by a large channel, and here it was decided to return. The latitude was found to be the record one of 86° 34′. Great praise is due to Cagni for his pluck and determination under difficulties which would have made most men give up in despair. Coming from a country which enjoys a warm climate, the severe temperatures must have caused the party to suffer greatly, but added to this in Cagni's case was the torture he had to undergo from his mortifying finger.

The return journey was begun on the 25th with four sledges, thirty-four dogs, provisions for thirty days, 200 rations of pemmican for the men and 300 rations for the dogs. On the first day's march the party covered the remarkable distance of 29 miles. The outward track assisted greatly on the return. The progress at first was very good; in four days the party advanced 1 degree towards the south.

On the 2nd May, Cagni improved the condition of his finger, which had again pained him greatly. The glands in the armpit were also inflamed. When the finger was unbandaged, it was found to be greatly swollen. With a lancet in his left hand, Cagni opened the swelling and gave outlet to a large quantity of matter. After taking

away a covering of dead flesh, a piece of bone was found sticking out of the wound. Cagni had only scissors to work with, but with these he managed to cut off the projection. The whole proceeding occupied him fully two hours. His courage was beyond praise.

On the 8th May the latitude was found to be 83° 42′. On this date the temperature had risen to freezing-point. On the 10th, Cagni discovered that he had drifted about 8 degrees of longitude to the west of Teplitz Bay. In the latitude he was in this represented about 57 geographical miles. He therefore steered a course more to the east. In spite of this new direction, Cagni found two days later that he was still farther to the west. He now hesitated to steer more to the east in case his chronometers had been going more slowly, due to the rise in temperature. This decision had an important bearing on the future trials of the party.

On the 18th May it was found that though the party had been travelling nine days towards the south-east, they were still on the same meridian. Channels now became so frequent that the course was difficult to keep, and the weather became stormy and foggy. On the 23rd May latitude 82° 1′ was reached, so that the party was now nearly on a level with the northern part of Prince Rudolf Island. The drift was, however, so great that during the next six days only about 10 miles were covered towards the island. Provisions were now running short, and both the physical and mental condition of the men began to deteriorate. According to the longitude, they were still 6 degrees west of Teplitz Bay.

It now became necessary to ferry the sledges and dogs across the channels on large pieces of ice, and progress became very slow. After struggling desperately towards the east, it was found on the 7th June that they were farther to the west than on the 1st of the month. The

week's toil had therefore been in vain. This made Cagni come to the wise decision to give up fighting against the drift, and to proceed southwards, where he would probably reach islands from which he would have a better chance of reaching Prince Rudolf Island.

On the second day after setting out to the south, land was sighted, and turned out to be Harley Island. On the 10th the party found it necessary to begin eating dog's flesh. The coast of Harley Island was reached on 13th June, but still they kept to the ice, and followed the coast until they reached the north-west extremity of the island. They then steered for Ommaney Island, where they arrived at midnight on the 13th. This island was crossed, but on attempting to leave it the ice was found impracticable, and twice the party were forced to retrace their steps. The third attempt was successful, after great labour among moving ice. A broad channel was found open along Karl Alexander Land, and Cagni therefore steered a course in the direction of Cape Germania.

When they awoke on the morning of the 20th June, they found they were afloat on a floe about 60 yards in diameter. Here they had to remain two days at the mercy of the wind. Prince Rudolf Island was reached on the 23rd June, and the party arrived at the tent at Teplitz Bay on the same date.

This sledge-journey by Cagni is the longest ever made over the ice of the Arctic Ocean before that of Dr. Cook. Starting from a comparatively low latitude, he yet was able to surpass the record made by Nansen. He had, of course, advantages which Nansen did not possess: he had a base to fall back upon, and he had the assistance of other two detachments; but on the other hand he had to start from a much lower latitude. The achievement of the Italians is one of which any country might be proud.

Steps were now taken to free the ship from the ice, which was from 10 feet to 18 feet thick. Holes were drilled in this ice along one side of the ship, and into these holes guncotton was placed and exploded. All their efforts at first were of little avail, but they eventually succeeded in righting the ship. A channel 180 yards long had next to be blasted in order to get the ship out of the bay. In forming this channel nearly all the explosives were exhausted when it was completed on 10th August. The provisions and equipment were now put on board, and everything being ready on 16th August, the *Polar Star*, which was still seaworthy, left Teplitz Bay on the return journey.

Cape Flora was reached on 31st August, after considerable difficulties with the ice on the passage south. There was still a faint hope that the missing detachment might be here, but no trace of it was found. As a final precaution, provisions sufficient for twenty men during eight months were left here; a still larger quantity had been left at Teplitz Bay.

On the 2nd September the *Polar Star* escaped from the drift ice; on the 5th the rugged mountains of Norway were in view, and Tromso was reached on the 6th.

Although this expedition added no new land to our maps, the results were important. It proved that a ship could be taken to the northern part of Franz-Josef Archipelago, and that a properly equipped sledge-expedition could travel a distance of 5° of latitude over the ice of the Arctic Ocean.

Franz-Josef Archipelago has since been visited by two Polar expeditions known as the "Ziegler Expeditions," but these have added little to our previous knowledge.

CHART OF NORTHERN PART OF GREENLAND.

CHAPTER XIII

PEARY'S EXPEDITIONS (1886–1909)

Commander R. E. Peary is the most persevering and the most daring of all Arctic explorers. He tells how he was induced to take an active interest in Arctic exploration. An old book-store in Washington was a favourite haunt of his, and one evening he there came across a paper on the Inland Ice of Greenland, and found the subject so interesting that he followed it up. He consulted various authorities, but found very conflicting statements. He therefore determined to visit Greenland and investigate the matter himself. He was then a lieutenant in the United States Navy.

The Navy Department having granted his application for leave, he made the necessary arrangements, and left Sydney on the steam-whaler *Eagle* in May 1886.

Arriving at Godhavn on 6th June, he left the whaler, and made preparations to explore the Inland Ice from the neighbourhood of Disco Bay. He was delayed two weeks at Godhavn by the ice before he could embark for Ritenbenk, at the head of the bay.

On the 23rd June he left Ritenbenk with Christian Maigaard, who was Assistant-Governor there, and eight natives, and made for Pakitsok Fiord. The head of the fiord was reached on the 25th, and on the 28th everything had been carried up to the ice-cap.

Peary's sledging equipment had been made under his

own supervision. He had two 9-foot sledges, 13 inches wide, made of hickory, steel, and hide, on a modified Hudson Bay pattern. With drag-ropes and lashings each weighed 23 lb. He carried jacketed alcohol-stoves, 9-foot double-ended ash alpenstocks with steel point and chisel, rubber creepers, snow-shoes, and ski. His rations consisted of tea, sugar, condensed milk, hard bread, pemmican, cranberry jam, baked beans, Liebig extract, and an experimental mixture of meat, biscuit, and desiccated potato.

The natives left the party at the edge of the ice-cap. On the 29th June, Peary and Maigaard started due east. A few hours after setting out, a furious storm came on, and it was deemed advisable to return to the head of the fiord and wait there till the weather improved.

On the 5th July the storm abated, and Peary and Maigaard set out once more. They reached the sledges, dug them out of the snow, and started due east again.

After crossing a network of crevasses, they encountered a series of lakes which were not frozen hard enough to support them. They had frequently to wade through a morass of saturated snow.

On the 15th July another storm compelled them to lie up four days at an elevation of 7525 feet above the sea. This camp was 100 miles from the margin of the ice-cap, and was the farthest point reached. Only six days' provisions were left, and Peary decided to return.

The return journey was made rapidly, but they had several exciting experiences. On one occasion Maigaard was nearly lost in a crevasse, and on another Peary was swept away in a glacier stream.

On his return to Ritenbenk, Peary set out for the Noursoak Peninsula, which he crossed alone to the edge of the Great Kariak Glacier, and then returned. This journey across the peninsula occupied three days.

From this expedition to Greenland, Peary states that he returned with the northern bacilli in his system, the Arctic fever in his veins, never to be eradicated. He was full of enthusiastic plans for accomplishing the crossing of Greenland. Duty, however, absorbed his energies during the next few years, and in the meantime Nansen effected the crossing of Southern Greenland over one of the routes which Peary had suggested.

Peary now fell back on his more ambitious scheme—the determination of the northern limit of Greenland overland.

He laid his plans before the Philadelphia Academy of Natural Sciences and other learned bodies, and received their support. He then obtained eighteen months' leave, and made the necessary preparations for his expedition of 1891–92. He approached the Dundee whaling companies and the Director of the Greenland trade, but they refused to transport his party to Greenland on any terms. He was therefore compelled to charter a vessel, but was fortunately successful in raising funds to meet the greatly increased cost.

Peary and a party of six, which included his wife, left Brooklyn in the *Kite* on 6th June 1891. His party consisted of Frederick A. Cook, surgeon and ethnologist; Langdon Gibson, ornithologist and chief hunter; Eivind Astrup; John M. Verhoeff, mineralogist and meteorologist; Matthew Henson, body-servant.

The master of the *Kite* was Captain Richard Pike, who was a famous Arctic skipper. It was he who took Greely's expedition to Lady Franklin Bay, and he was in command of the *Proteus* when Lieutenant Garlington attempted to relieve Greely.

Peary had two whale-boats built for the expedition, and in these it was intended to return to the Danish settlements from Whale Sound. He also carried wood for a 12 by 20 feet house.

Godhavn was reached on 27th June, and left on the 29th. A stop was made at Upernavik, where Peary expected to obtain a kayak and a native interpreter, but failed to get either.

No obstruction to the *Kite's* progress was met until about 16 miles north of the Duck Islands. Here the dreaded Melville Bay pack was encountered, and the *Kite* after boring her way from the 2nd till the 4th July was completely beset, and did not escape till the 17th.

On the 11th July the ice slackened a little, and the *Kite* made attempts to forge ahead. While at this work a large cake of ice struck the rudder, jamming it hard over, and tearing the wheel from the hands of the two men on duty. One of the men was thrown clear over the wheel, and the next instant the iron tiller had caught Peary's leg between it and the deck-house, and snapped both bones just above the ankle. He was immediately carried to the cabin, where his leg was set.

This was an extremely serious accident for Peary, and a man with less determination would have given up the expedition and returned home. This idea did not seem to occur to Peary. Even with a broken leg at this critical period, he decided that everything must go on.

It was his intention to secure a winter camp on the north shore of Inglefield Gulf; but the *Kite* met unbroken ice, and was ultimately run into McCormick Bay. Here a site for the house was soon selected, and preparations were at once made to land provisions and stores.

On the 26th July work was commenced on the house. During the delay in Melville Bay pack, Peary had the wood cut and fitted, and now it had only to be nailed together and erected.

The interior dimensions of the house were to be 21 feet in length, 12 feet in width, and 8 feet in height from floor to ceiling. It consisted of an inner and an outer

shell, separated by an air-space, formed by the frames of the house, and varying from 10 inches at the sides to over 3 feet in the centre of the roof.

On the outside of the frames was attached the outer air-tight shell composed of a sheathing of closely fitting boards and two thicknesses of tarred paper. To the inside of the frames was fastened the inner shell, composed of thick trunk boards, and made air-tight by pasting all the joints with heavy brown paper. This inner shell was lined throughout with heavy blankets.

To still further protect it, a wall was built entirely around the house, about 5 feet distant from it. The foundation of this wall was composed of stones, turf, and empty barrels. Above this, the wooden boxes containing tinned supplies were piled in regular courses in such a way that the contents could easily be reached. From the top of these, canvas was stretched to the side of the house so as to form a corridor.

When the snow came, a wall of this was built outside of the other, and the roof of the house was also thickly covered with snow.

On the 27th July, Peary was taken ashore, strapped to a plank, and placed in a tent near the site of the house, so that he might supervise the work.

The *Kite* departed for the south on the 30th July, and Peary and his party were left to their own resources.

Near at hand rose cliffs of a reddish colour, and this fact induced Peary to name his house "Red Cliff House." Its position was found to be 77° 40′ north latitude, and 70° 40′ west longitude. It was therefore about half-way between the Arctic Circle and the North Pole.

On the 12th August, Dr. Cook, Verhoeff, Astrup, and Gibson were sent to Herbert, Northumberland, and Hakluyt Islands. They left provisioned for fourteen

days. The object of the journey was to obtain birds from the loomeries, to make plans of Eskimo houses and villages, to communicate with the natives and obtain from them furs and clothing. They were also to try and induce a family of natives to settle near Red Cliff House.

They returned on 18th August with 130 guillemots, and also brought an Eskimo family, consisting of a man, his wife, and two children, with a kayak and harpoon, a sledge and a dog. They had shot a small walrus near Herbert Island, and had towed it to Cape Cleveland, a little over 2 miles from the house. Several other walruses were obtained before the end of the month.

On the 4th September the entire party, with the exception of Henson, set out for the head of McCormick Bay with supplies intended for a dépôt to be established on the Inland Ice in the neighbourhood of the Humboldt Glacier.

On the 5th September, Astrup went up the slopes to the ice-cap to select the best route for carrying up the provisions. He returned with a favourable report, and estimated the distance to the ice-cap at less than 4 miles.

On the 6th September, Astrup, Gibson, Verhoeff, and Cook started up the bluffs with loads varying from 52 to 58 lb., and towards night on the same day they carried up a second load. On the 7th the last loads were taken up, and Astrup, Gibson, and Verhoeff, who were to form the Inland Ice party, remained at the ice-cap, while the others returned to Red Cliff House.

This Inland Ice party returned to Red Cliff on 12th September, and reported that the attempt to establish a dépôt had been a failure. Owing to the presence of deep soft snow, it was found that not more than one sledge could be dragged at a time, and on the 8th September the party advanced only 1 mile. On the 9th they were kept in

camp by a snowstorm and high wind. On the 10th they advanced 1 mile by noon, and as there was no prospect of better sledging, they deposited one of the sledge-loads on a nunatak at an elevation of 2600 feet above sea-level, and returned to Red Cliff without their sledges or sleeping-gear.

On 22nd September, Peary sent Astrup and Gibson back to the Inland Ice to study the condition of travel as far north-east as possible. They dragged their sledges five days, and attained an altitude of 4600 feet; but owing to snow-squalls, high winds, and hard hauling, they then decided to return.

During October many Eskimo arrived at Red Cliff, and from this time onwards various parties were coming and going all through the winter. Some came from Cape York, nearly 200 miles away. Several of the women were engaged to make fur clothing for the party.

During the winter Peary kept his party busy making sledges, odometers, and various other articles required for the spring sledge-journey.

Peary devised and cut the patterns for the suits and sleeping-bags. These were made from the skins of the deer shot by Peary's men. The skins were stretched and dried at Red Cliff, and the chewing was done by the Eskimo women. This latter process makes the skins thoroughly soft and pliable. A skin is folded with the hair inside, and is chewed along the fold; then another fold is made, and the process is repeated until the whole skin has been carefully chewed. After this, it is scraped and worked with a blunt instrument. It takes two women about a day to chew a big buck-skin, and they usually require to give their jaws a rest every alternate day.

Peary took a series of photographs of seventy-five Eskimo, and Dr. Cook took the anthropometrical measurements. It may here be mentioned that Peary's photo-

graphic work was excellently done, and added very much to the value of his explorations.

On 18th April 1892, Peary started on a trip round Inglefield Gulf. The purpose of the journey was to complete the necessary complement of dogs for the ice-cap march, to purchase furs and materials for the equipment, and as far as practicable map the shores of the gulf. Peary was accompanied by his wife. He returned on 24th April, having in the short space of one week made a sledge-journey of some 250 miles.

During the month of April most of the supplies for the great journey over the ice-cap had been carried up to the edge of the ice. On the last day of April, Dr. Cook, Gibson, Astrup, and five Eskimo left Red Cliff with two sledges and twelve dogs, dragging the last of the supplies. Peary and Henson followed on the 3rd May with the remaining eight dogs and a large dog-sledge.

The three sledges used by Peary on this journey consisted of two long, broad wooden runners curved at both ends, with standards supporting light but strong cross-bars. The largest sledge was 13 feet long and 2 feet wide, with runners 4 inches wide, and standards 6 inches high. It was composed entirely of wood, horn, and raw-hide lashings. It weighed 48 lb., and carried easily a load of 1000 lb.

The second sledge was 11 feet long and 2 feet wide, with $3\frac{1}{2}$-inch runners and 6-inch standards. It weighed 35 lb., and carried a load of 500 lb.

The third sledge, made by Astrup, was 10 feet long and 16 inches wide, with 3-inch runners and 2-inch standards. It weighed 13 lb., and carried a load of 400 lb.

The clothing consisted of a hooded deer-skin coat weighing $5\frac{1}{4}$ lb., a hooded seal-skin coat weighing $2\frac{1}{2}$ lb., a pair of dog-skin knee-trousers weighing $3\frac{9}{16}$ lb., seal-skin

boots with woollen socks and fur soles weighing 2 lb., and an under-shirt; total, about 13 lb. With various combinations of this outfit, Peary could keep perfectly warm and yet not get into a perspiration, in temperatures from $+40^{\circ}$ F. to -50° F., whether at rest, or walking, or dragging a sledge.

Peary had twenty dogs for the journey, but one died from the fatal *piblockto*, at the edge of the ice-cap. His dog-food consisted of pemmican.

The provisions included pemmican, butter, Liebig extract, biscuit, condensed milk, compressed pea-soup, compressed tea, and extract of coffee. The daily ration was $2\frac{1}{2}$ lb. per man.

From the edge of the ice-cap the sledges had to be dragged up one snow-slope and down another for a distance of 15 miles, before reaching the gradual slope of the true Inland Ice. This point was not reached until the 15th May.

Peary took a true north-east course, and hoped to clear the heads of the Humboldt, Petermann, and Sherard-Osborn indentations. From this point, two short marches of 5 and 7 miles brought them to an elevation of 5000 feet, and early in the third march the highest summits of the Whale Sound land disappeared, and they found that they were descending. They had passed over the divide between Whale Sound and Kane Basin, and were on the descent towards the basin of the Humboldt Glacier. This third march was 12 miles, and the fourth was 20, and the distant mountain-tops of the land between Rensselaer Harbour and the south-eastern angle of Humboldt Glacier rose into view in the north-west.

On the fifth day they covered 20 miles over a gently undulating and gradually descending surface. On the sixth march the surface became much more hummocky, and Peary thought it advisable to deflect about 5 miles

to the eastward. At the end of this march there were signs of an approaching storm, and a snow igloo was built for shelter.

The storm lasted forty-eight hours, and it took a long time to dig out the sledges, which had been completely buried in snow-drifts, and reload them.

Starting out from here, they found that the storm had made a good road for them, and they covered 20 miles during the first march. On the following day they again made 20 miles, and reached the point where Peary decided the supporting party should leave him. They were now 130 miles from the shore of McCormick Bay.

It was here that Peary resolved to take only one companion with him. It had originally been his intention to take two, but due to a frozen heel, Henson had to be sent back to Red Cliff from the edge of the ice-cap. All three of his companions volunteered to go with him. Peary decided that Astrup should be his companion, that Gibson should return in command of the supporting party, and that, on their return to Red Cliff, Dr. Cook was to assume charge.

Next day, Gibson and Dr. Cook started on the return journey, and Peary and Astrup continued the march towards the north-east. Peary had now thirteen dogs. On the second march all the dogs were made to drag the big sledge, and the other two sledges were put in tow of the big one. Peary went ahead as guide, and Astrup followed driving the dogs. They had gone but a short distance on this march when the big dog-sledge broke down, one side bending inward and breaking all the standards on that side. This at first seemed a serious accident, but by lashing the broken sledge alongside another, and so making a broad 4-foot-wide sledge with three runners, the difficulty was overcome. The

accident, however, had the effect of reducing the march to one of 10 miles. Next day the snow was deeper and softer, and but 15 miles were covered. During this latter march they began to ascend, and the snow was so deep that the sledges sank in it nearly to the cross-bars. This made the hauling so heavy that Peary contrived an impromptu sledge from an extra pair of ski, and transferred to it 120 lb. from the big sledge. On this day one of the dogs was ill, and at night it was killed and fed to the others.

On the following day the up-grade and the deep snow compelled them to make two journeys in hauling the sledge. Next day the surface fortunately improved, and 15 miles were covered.

They were now evidently at the top of the grade, and soon began a gradual descent toward the basin of the Petermann Fiord. During this march they made 20 miles, and sighted land to the north-west.

On the last day of May the head of Petermann Fiord, with its guarding mountains, suddenly came into sight, and Peary found it necessary to deflect some 10 miles to the eastward to avoid the inequalities of the glacier basin. Peary camped here thirty-six hours, and determined his position and took bearings of the land.

From this camp the surface was comparatively level, and the highest summits of the Petermann Mountains were kept in sight for 40 miles. Then began a gradual rise, the snow becoming softer and deeper.

On the 5th June the summit of the next divide was reached at an elevation of 5700 feet above sea-level. From here the travelling was very good, and 19½ and 21 miles were made in two marches; and on the 8th June they camped in sight of St. George's Fiord, but they believed it was Sherard-Osborn Fiord. At the end of

this march a storm broke upon them, and they were imprisoned in a rough shelter two days.

Peary now found that he was on the southern edge of a great glacier basin, and to avoid this he deflected his course to the south-east, which forced him to ascend steep icy slopes. It took two days of the hardest work to get out of this trap, and at the end of them he had lost 15 miles of his hard-earned northing. During this climb, Peary's best dog, the king of the team, received a sprain. After limping at the rear of the sledges for two or three days, he lagged behind, and was lost in one of the ice-cap storms. Two dogs fell into a crevasse and hung suspended at the end of their traces until hoisted out.

Starting again on a north-east course, they had not advanced far when they were brought up by a group of enormous crevasses, and just as these were reached a dense fog swept up from the glacier basin and delayed them eighteen hours.

Peary now decided to strike farther into the interior, so as to avoid these glacier basins, but in carrying out this plan he found the snow increasing and the grade so steep that he was compelled to steer more to the north.

He had advanced in this direction only 4 miles when the big sledge again broke down, and an entire day was lost in repairing it. Next day the temperature became so high and altered the surface of the snow so much that they found it impossible to go on. They had to wait a fall of temperature, and this did not occur for two days. At this camp spare articles weighing 75 lb. were thrown away.

Starting again, they made a march of $6\frac{1}{4}$ miles, going over the road twice. The following day, land again made its appearance ahead of them, and Peary deflected

first to the north-east and then to the east. Advancing 8 miles, they found themselves hemmed in by a series of huge concentric crevasses, and to cross these it was necessary to take a south-easterly direction. At one time two dogs fell into a crevasse, and at another one of the sledges broke through.

Next day they covered nearly 18 miles, and on the following one they made 20½ miles. Land was now visible to the north-west, north, and north-east.

Towards the close of the next march a fiord with high sharp peaks on its northern side came clearly into view. Starting again on the 26th June in a north-east direction, Peary soon changed the course to east true, and then to south-east, so as to avoid a fiord which was seen ahead. Assuming this fiord to be Victoria Inlet, and thinking he could round it, Peary kept on to the south-east till the 1st of July, but still the mountains of the shore were in view. On this day a wide opening, bounded on either side by high vertical cliffs, showed up in the north-east over the summits immediately adjacent to the Inland Ice. Through this opening could be seen neither the reflected ice-blink of distant ice-cap nor the cloud-loom of land.

Peary now decided to reach this opening and discover whether it looked out into the East Greenland Arctic Ocean. Changing his course to north-east, he made for the red-brown mountains of the strange land. The grade now became so steep that it was necessary to descend diagonally along the slope.

The highest convex of a crescent moraine which climbed well up into the ice-cap was selected as a landing-place, and after wading many streams, and floundering through a mile of slush which covered the lower portion of the ice, they clambered upon the rocks of the moraine 4000 feet above the sea.

Here Peary left Astrup to look after the dogs while he hastened down to the land for the purpose of climbing a summit some 5 miles from the edge of the ice. He had not gone far when a snow-bunting fluttered up from behind a rock, and not long afterwards he came across the traces of musk-oxen. As he got farther from the ice, flowers of various hues made their appearance, among them the yellow Arctic poppy.

Instead of 5 miles, the distance of the mountain lengthened to at least 12, and when it was reached at the end of an eight hours' march, it was only to find that two or three other summits intervened between Peary and the view he wished. By this time the soles of Peary's kamiks were cut through, and some of the sharp stones had cut his feet. He patched his foot-gear with a pair of seal-skin mittens and a skull-cap, and after an hour's rest he started on his return to Astrup, and reached him after an absence of fifteen hours.

Peary now decided to take Astrup and the dogs, which numbered eight, and three or four days' supplies, and march overland. They started out on 3rd July 1892, carrying about 40 lb. each on their backs. On the second day's march they were fortunate in coming across musk-oxen, and succeeded in killing two. This gave both the men and the dogs a welcome change of food, and they feasted till they could eat no more.

After several hours' rest, they again set out, and succeeded in gaining a rocky plateau, 3800 feet above sea-level. This dropped in a perpendicular cliff into a bay below. Looking out over a mighty glacier on the right and through the broad mouth of the bay, they saw stretching away to the horizon the great ice-fields of the Arctic Ocean. To the west was the opening of a fiord which Peary believed was the one which barred his northern advance, and he had paralleled its course across

the northern end of the mainland from Robeson Channel to the shores of North-East Greenland. This channel, which Peary believes marks the northern boundary of the mainland of Greenland, now receives the name of "Peary Channel."

To the north-west, north, and north-east stretched steep red-brown bluffs on the other side of the bay. To the northward could be seen the entrance of a second fiord, or channel, apparently extending to the north-westward.

The land which stretched away to the north-east was free of snow. In this direction land could be seen 60 miles away. From observations taken by Peary on the cliff, afterwards named "Navy Cliff," the position was found to be 81° 37′ 5″ north latitude, and 34° 5′ west longitude. After building a cairn and leaving a record, they retraced their steps towards the ice-cap.

On this northern land, besides snow-buntings, two or three sandpipers, a Greenland falcon, a pair of ravens, two bumble-bees, several butterflies, innumerable flies, and about twenty musk-oxen were seen. Flowers of numerous species were blooming in abundance.

Two days were occupied in getting back to Moraine Camp, and when it was reached the feet of six of the dogs were cut and bleeding. It was therefore necessary to rest and allow the dogs to recover, and it was also necessary to thoroughly overhaul the impedimenta and put everything in good order for the return journey.

The big three-runner sledge was reduced to its original dimensions, and the foot-gear required a good deal of attention. At last, on 7th July, all was ready, and they started up the icy slope.

In order to avoid crevasses and glacier basins, Peary returned on a course well to the east of his upward one. On the first day only 10 miles were covered, but on the

second they made 21½ miles, and ascended 1300 feet. On the 10th July an advance of 20 miles was made, and an ascent of nearly 1000 feet. On the 11th the altitude rose 600 feet in another march of 20 miles. The elevation was now 7300 feet above sea-level. On this date one of the eight dogs became exhausted, and was killed and fed to the others.

They now experienced a severe storm, which detained them two days. On the first march after the storm they travelled 20 miles over a level plateau in a thick fog.

Next day one of the dogs died, and now only six were left, and Peary became anxious about the remainder. On the 18th July the fog cleared. On the 21st, Peary decided to abandon one sledge and leave behind articles weighing about 50 lb. The load was repacked on the small sledge.

Another of the dogs died on 28th July, but the remaining five were in fairly good condition. On this day 22 miles were covered, and the next few marches were even better. They were now east of the Humboldt Glacier.

On the 2nd August they neared the divide between the Kane Basin and the Whale Sound region, and next day they sighted land, after travelling 35 miles.

On the following day, when nearing the edge of the ice-cap, a relief party came into view, and soon Peary had the pleasure of meeting Professor Heilprin, who had come north in the *Kite* to take Peary home.

Two days after his return to Red Cliff, Peary set out on a boat-voyage into Inglefield Gulf, with the object of becoming better acquainted with the northern shore. He explored Bowdoin Bay to its head, and at this point Verhoeff, who formed one of the party, left to cross the glacier to McCormick Bay, where he was to meet Gibson.

Leaving Bowdoin Bay, Peary passed eastwards along

the gulf, and reached a striking, precipitous island, which he named "Josephine Peary Island."

On returning from this boat-voyage, Peary learned that Gibson had landed Verhoeff at Five-Glacier Valley a few days after he had left Bowdoin Bay. Verhoeff's intention was to make an overland trip to the Eskimo settlements in Robertson Bay, and he arranged with Gibson to return for him at a certain time. The day after Peary's return, Gibson arrived with the news that Verhoeff had not turned up according to promise.

Peary at once set out with Gibson and a crew of his best Eskimo to search for Verhoeff. Heilprin's party and the *Kite*'s crew also took part in the search, which was continued six days and six nights. The Eskimo ultimately succeeded in finding traces along the side of a glacier, and these were found to pass on to the glacier itself, but they disappeared on the unyielding surface of the ice.

The search was now given up. The conclusion arrived at was that Verhoeff had fallen into one of the innumerable crevasses of the glacier and had there perished. This sad incident naturally cast a deep gloom upon the party, and on Peary especially.

Preparations were now made for the return home. Mrs. Peary distributed many household utensils to the delighted Eskimo, who also received numerous presents of wood, knives, iron, kettles, etc., which had been brought in the *Kite* from friends of the expedition.

At Godthaab, on the way home, some of the kayakers of the place treated them to an exhibition of aquatic feats, such as turning a somersault in the water and jumping one kayak over another. The remainder of the voyage was completed without special incident.

Soon after his return from this expedition, Peary made preparations for a more ambitious one. In order to raise

funds, he delivered one hundred and sixty-eight lectures in ninety-six days. From these he realised 13,000 dollars. He also obtained some funds from other sources, and was able to charter a ship named the *Falcon* to take his party north, and return the following season to bring him back.

Peary left Philadelphia in the *Falcon* on 23rd June 1893. The ship carried a steam-launch, and the two whale-boats, the *Mary Peary* and the *Faith*. The six dogs of the *White March* and some carrier-pigeons were also taken. In order to make a new experiment in Arctic work, Peary took some burros which had been brought from Santa Fé. Several places on the American coast were stopped at, and St. John's was not left till 15th July. On the same day one of the dogs managed to slip its harness, and was lost overboard. On the 17th, during heavy weather, two of the burros died. The *Falcon* touched at Battle Harbour on the Labrador coast, in order that dogs might be purchased; but Peary met with but little success. Other two stations were visited, but as a total result only twenty dogs were obtained. On the 22nd July the *Falcon* was headed for the Greenland coast, and it arrived at Holsteinborg on the 26th. Here seventeen dogs were obtained, and near midnight of the same day the *Falcon* left for Godhavn, where it arrived on the 28th. Fur clothing, ordered from Copenhagen, was found ready, and twenty dogs were obtained. Peary had been mindful enough to take a present of oranges, lemons, and pine-apples to Mrs. Anderson, the Inspector's wife, and it gave great delight to her and her family. Godhavn was left about 10 p.m. on the 28th, and Upernavik was reached on the 30th. Peary was disappointed in finding that only ten dogs were to be obtained here, but he was informed that he would get more at Tasiusak, about 40 miles to the north. The latter place was reached early in the morning of 31st July, and seventeen dogs were obtained. Peary had now

on board eighty-seven dogs, and the pandemonium caused by these howling, fighting, restless animals was indescribable. The Duck Islands were reached about noon, and after a few hours' stay, the passage of the dreaded Melville Bay was begun. The weather was excellent, and where two years before the *Kite* had to battle with the pack, there was open water with only a few scattered icebergs. The passage was made in the record time of 24 hours and 50 minutes.

Peary landed and climbed Cape York. None of the natives here had seen or heard anything of Verhoeff.

Bowdoin Bay, in Inglefield Gulf, where Peary intended taking up quarters, was reached on the morning of 3rd August.

Peary selected the site of the house, and they soon set to work to build this and unload the stores. The house was named the "Lodge."

On the 12th August the *Falcon* left the bay on a cruise for the winter's meat-supply. Near Herbert Island they were successful in obtaining twenty-four walruses. During the hunt there was one exciting event. A walrus had been shot, and a man was beside it on a cake of ice, when the ice was struck by the *Falcon* and capsized. The man was thrown into the water under the ship's stern, but he succeeded in clinging to the rudder, from which he was released in safety.

The *Falcon* next steamed north as far as Littleton Island, where other four walruses were shot. While here, Peary and his party examined the site of Polaris House, and found the place littered with miscellaneous articles of no use to the natives. Peary also climbed to the top of Littleton Island. He describes it as a terribly desolate, barren-looking piece of rock.

The *Falcon* now turned southward on the way to Olriks Bay, on the south coast of Inglefield Gulf, for deer.

During one night the party shot seventeen deer, and as a sufficient supply of meat had now been obtained for the dogs and natives during the winter, the *Falcon* went back to Bowdoin Bay.

On the 20th August the ship returned to America. Peary's party, including himself, now numbered fourteen persons :—

Samuel J. Entrikin, first assistant.
Eivind Astrup, second assistant.
Edward E. Vincent, surgeon.
E. B. Baldwin, meteorologist.
George H. Clark, taxidermist.
Hugh J. Lee.
George H. Carr.
James Davidson.
Walter F. Swain.
F. A. Stokes, artist, an independent member.
Mrs. Peary.
Mrs. Susan J. Cross (Mrs. Peary's nurse).
Matthew Henson (Peary's coloured man).

On 29th August, Astrup left the Lodge in charge of an Inland Ice party, consisting of Carr, Davidson, and Lee. They took with them five sledges and fifty dogs, with the intention of establishing a dépôt of supplies as far in on the Inland Ice as possible.

On 7th September a letter was brought by one of the carrier-pigeons from the Inland Ice party, asking for more dogs; and Peary visited the camp, which he found 6 miles in on the cap. Astrup was suffering from something in the nature of a chill, and the doctor had to be sent to him. In a day or two he was much better, and able to continue his work.

On 12th September a little blue-eyed snowflake was born at the Lodge, and named Marie Ahnighito Peary.

She was bundled in soft, warm Arctic furs and wrapped in the Stars and Stripes. This wonderful baby was of extraordinary interest to the natives. Families journeyed from Cape York in the south, and from Etah in the north, to satisfy themselves that she was not made of snow. Until about six months old she lived in continuous lamp-light.

On 13th September, Astrup was brought down from the ice-cap, suffering from gastric trouble. The supplies were then 12 miles from the edge of the ice, with the exception of two sledge-loads which were 3 miles farther in. Carr and Davidson, who had brought down Astrup, started back to rejoin Lee, but they lost themselves in a storm and had to return to the Lodge. A day or two later they made a second attempt, and succeeded in reaching Lee, who had been alone for a week. Here again a storm came on, and confined them to the tent another week. They then all returned to the Lodge, which they reached on 23rd September.

Two days later, Peary set out with the party; but at the moraine, at the edge of the ice, it was found that three sledges which had been left there had been blown away. They had in consequence to return to the Lodge and make new sledges.

On 30th September, Peary, Davidson, and Lee succeeded in reaching the camp on the ice-cap, and found the advanced sledges. Again they returned to the Lodge for more dogs, and with these they advanced all the supplies to a point 26½ miles from the moraine.

Peary wished to have them advanced still farther, but a gale kept the party to their camp two days. They then descended to the Lodge, but the storm lasted an entire week. Another attempt was made by nearly the whole party to reach the ice-cap, but in consequence of a constant succession of snowstorms and high winds it had to be given up.

The season was now so far advanced that Peary abandoned the idea of taking the supplies farther until the spring.

On 31st October a large wave caused by a huge iceberg from the Bowdoin Glacier burst up through the solid ice near the shore, rolled the steam-launch over and over, and stove it in; dashed the whale-boat a hundred yards up the valley, and ruined it; then, receding, carried away all the oil-barrels. It had been Peary's intention to put up an electric-light plant, but the loss of the oil rendered this impracticable.

While the ice-cap work was going on, Entrikin was busy hunting deer, in which he was most successful. In two hunts he obtained no less than sixty animals.

The long sunless winter had now begun, but the party were still kept at work. Much in the way of Inland Ice equipment had to be got ready, and various sledge-journeys were made for dog-food. About 700 miles were travelled, and some 3000 lb. of dog-meat brought to the Lodge, and yet no member of the party suffered any great discomfort. These journeys were made in the moonlight.

The sun made its appearance on the 18th February 1894, and on this day Lee, with two Eskimo and a team of dogs, set out for the cache on the Inland Ice. Lee, unfortunately, lost his way during a storm, and after wandering about for a night and a day, reached the Lodge in an exhausted condition and with a frozen toe. This mishap disarranged Peary's plans. He had intended to start from the cache on 1st March. Lee was to free the cache from the winter's snows, bag the pemmican, and construct snow igloos. The delay necessitated a further supply of dog-meat, which had to be hauled a distance of at least 50 miles.

On the 6th March eight members of the party, with five Eskimo and some eighty dogs, started for the ice-cap. Next day Peary left with two Eskimo carrying several

gallons of boiling hot tea in canteens, and found the party about 2 miles from the moraine. Peary then returned to the Lodge, which he finally left on 8th March, and reached the ice-cap party in the evening.

Next day the cache was reached, and the snow was found to have drifted about it during the winter to a depth of 4 feet. The Eskimo formed snow igloos, and two days were spent here making preparations for the final start. On the 10th March one of the dogs died from *piblockto*, the dreaded dog-disease of Greenland, and this was naturally considered a serious incident.

A start was made on 12th March, after considerable difficulty with the dogs. Lee's toe had been nipped again, and at night it was found that he could not proceed much farther. Astrup also informed Peary that he was threatened with the illness which attacked him in September, and that he was not able to go on. This loss of two of his best men was a serious blow to Peary's plans. It had been his intention, should he reach Independence Bay, to send one party northward, another south to Cape Bismarck, and thence over the ice-cap to Whale Sound; while a third party was to remain at Independence Bay and survey that region while awaiting the return of the northern detachment.

On the 14th March, Peary, accompanied by Clark, returned to the Lodge with Lee and Astrup. The Lodge was again left on the afternoon of the 15th. The night was passed in a snow igloo, and the party was reached during the following afternoon. Next day the weather made it impossible for them to advance, and so continued for three days. The temperature was from 35° to 40° F. below zero.

On 22nd March a start was made, but the weather was still unfavourable, and only 3 miles were covered. The party now experienced a violent storm, which lasted

till the 25th March. The velocity of the wind averaged over 48 miles per hour during thirty-four hours, and the average temperature was 50° F. below zero. In Peary's opinion this storm was the most severe ever experienced by any Arctic party.

After the storm was over, half of the dogs were found frozen fast in the snow, some by the legs, some by the tails, and some by both. Two were dead.

During the storm Davidson had his heel, and Clark a toe and three fingers, frost-bitten. Davidson had to be sent back to the Lodge with the doctor. This now reduced the party to four, and Peary made a cache of supplies, and readjusted the loads.

Each of Peary's companions now had a large sledge drawn by eighteen dogs. During the first march they advanced 7 miles in a temperature of 46° F. below zero. On the 27th March they had considerable difficulty with the sledges: one broke in the bend of one of the runners, and it was converted into a three-runner sledge by lashing another sledge alongside it; and a second one was seriously damaged.

While engaged in repairing the sledges, Entrikin had the soles of his feet frost-bitten. To make matters worse, next day he strained his back in making efforts to start the sledge. During the night the temperature remained between 55° and 57° F. below zero.

The dogs were now in bad condition: three had been killed and used as dog-food, another died from the effects of the storm, and several had frost-bitten feet.

At the next camp Peary decided to rest two days, so as to give Entrikin a final chance of recovery, and also with the object of getting the dogs into better condition.

On the 3rd April, Entrikin's feet were much better, and the party pushed on a distance of 15 miles. On this day, however, one of the dogs was attacked by the

piblockto, and bit many of the other dogs before he was shot. On each of the next two days a distance of 15 miles was covered. During the next three days a storm confined them to their tent, and two dogs died from exposure.

Another start was made, but only 7 miles were travelled. Two more dogs died of *piblockto*, after biting nearly all the other dogs. The dread disease had evidently gained a firm foothold.

On 10th April, Peary had reached a point 128 miles from the Lodge. One man had frosted feet and must return. Another had both heels and great toes frost-bitten, and had daily attacks of bleeding from the nose. The third man had not quite recovered from cramp. Added to these troubles was the serious condition of the dogs. Peary now saw that he could not possibly carry out his plans. He might reach Independence Bay, but this would consume all his pemmican, alcohol, and other provisions, and destroy any chance of making another attempt next spring. He therefore decided to cache his pemmican and return to the Lodge, and make another attempt during the following year.

On the return journey a great many of the dogs died, only twenty-five reaching the Lodge. Peary admits that previous to this experience he believed that the Eskimo dog was capable of enduring the most severe weather possible on the ice-cap. It is also evident that the members of the party suffered greatly from the extremely low temperatures usually experienced during the month of March. The serious outbreak of the dog-disease could not have been foreseen.

The party on their return to the Lodge were very much exhausted, and it required about a fortnight to recover from the strain and exposure.

Soon afterward, Peary set out to explore and survey Olriks Bay. He was accompanied by Mrs. Peary. He

found it to be a long narrow fiord 50 miles in length by about $2\frac{1}{2}$ miles wide.

On 16th May he again left the Lodge to search for the "Iron Mountain" of Melville Bay. He took Lee with him and ten dogs. On the way to Cape York an Eskimo was met who undertook to act as guide to the object of Peary's search. Cape York was reached in ten days, after considerable difficulties. Another march brought them to the meteorite, which Peary measured and photographed.

The return journey was made under great difficulties. Sometimes they were storm-bound and had to dig shelters in snow-drifts, at other times they were wading through deep slush; again they were compelled to take to the shore and climb the bluffs and make long détours overland. Several glaciers were crossed, and at one place they were 3362 feet above sea-level. The Lodge was reached on 6th June.

On 31st July news was received that the *Falcon* had returned. During August, Peary endeavoured to obtain deer, but was not very successful.

On 26th August the *Falcon* again sailed for America. All Peary's party, with the exception of Lee and Henson, had decided to return home. The *Falcon* carried them safely to Philadelphia, but in returning to St. John's she was lost with all on board.

It will be most convenient here to give a brief account of a sledge-journey made by Astrup after he returned invalided from the ice-cap. On 6th April he started out with the intention of exploring the shores of Melville Bay. He took with him Koolootingwah, the Eskimo. Cape York was left on the 15th April, and over 40 miles were travelled the first day. Astrup found the shore, from Cape York eastward, continually broken by large and active glaciers. The night was passed in a snow igloo, and next day 30 miles were covered. On the

third day Thom Island was reached. All the dog-food was now gone, and Astrup had provisions to last only ten days. He therefore decided to examine the coast more closely, and gradually work back to Cape York, where he arrived on 23rd April. The Lodge was afterwards reached without special difficulty.

Peary and Matthew Henson, with five Eskimo, accompanied the *Falcon* about 200 miles from the Lodge, and returned in the whale-boat. Lee remained at the Lodge. Soon after Peary's return he made preparations for securing his winter's meat-supply. Henson with some Eskimo went off after deer, and returned a week later with six animals. Then Peary arranged a walrus-hunt. Both whale-boats and five kayaks were employed, and all the able-bodied men and boys of the village of Karnah. Such an imposing flotilla had never been seen before in these waters. Peary had decided to use a harpoon like the Eskimo, and in this he was very successful. Off Herbert Island several large walruses were obtained, and the boats returned loaded with meat.

Peary was now anxious to have the nearest of his caches on the ice-cap visited and rearranged, and proper signals put up where the original ones might be blown down. With this object in view, Lee, Henson, and the Eskimo Nooktah set out on the 2nd October with twelve dogs. To Peary's great disappointment, they returned in four days without having found any of the caches. There had been a most extraordinary fall of snow, and poles which had stood 8 and 9 feet above the snow were now only 1 foot above.

On 8th October, Peary, with Henson, and the Eskimo Maksingwah, more familiarly known as "Flaherty," set out for the ice-cap. On the second day they reached the vicinity of the first cache, but no trace of it could be found. Next morning signs of a coming storm induced

Peary to make preparations to meet it, and for some time it was not observed that Maksingwah had decamped rather than face a storm on the dreaded ice-cap. It was afterwards ascertained that it took the Eskimo four days to reach the Lodge, and he was then in an extremely exhausted condition.

The storm confined Peary and Henson to the tent six weary days. Peary's thoughts during this time were far from pleasant. He saw that this terrible storm was destroying the last chance of finding his caches, and this meant not only the destruction of all the work of that year, but also of the resources on which depended his chance of success next year.

When the storm passed over, a diligent search was made for the cache, but no trace of it could be found. Peary had to acknowledge the terrible fact that all his alcohol and pemmican, which with other provisions weighed nearly a ton and a half, were buried beneath the ice-cap.

The blow was a severe one, but with his characteristic tenacity of purpose Peary determined that venison and walrus-meat must take the place of pemmican, and that coal-oil must serve instead of alcohol. The idea of abandoning the journey, even after this overwhelming disaster, he could not entertain.

During December, Peary and Lee made a sledge-journey to Cape York. One of the main objects was to determine accurately the positions of some of the capes, but the weather was unfavourable most of the time. During the last stage of the return journey Peary was without food or sleep forty-six hours, and travelled 60 miles.

Several other journeys were made during the winter, for dog-food and various articles of equipment. Every effort was made to be prepared for the ice-cap journey, but when the time came to depart Peary was far from satisfied with his resources.

On 1st April 1895, Peary, Henson, and Lee, with six Eskimo, six sledges, and sixty dogs, left the Lodge. On one of the sledges, drawn by thirteen picked dogs, were the supplies for the return trip, and also those for consumption at and beyond Independence Bay. It had also the tent and sleeping and cooking gear, the total weight being about 1000 lb. Another sledge drawn by ten dogs held about 750 lb. of dog-food.

On the second day's march the vicinity of one of the caches was reached, and another determined attempt was made to find it, but in vain.

When the neighbourhood of the next cache was reached, a stop was made, and the Eskimo were sent out to make a search. In a short time a bag was found attached to a pole projecting only 3 inches above the surface. Peary had stopped within 100 yards of it. This cache contained ten cases of biscuit and a case and a half of milk, and was very acceptable. During the search, one of the Eskimo took the opportunity to decamp with his sledge and dogs.

During the next three days, journeys of 22, 28, and 30 miles were made, and carried the party well into the snow-shed of the Humboldt Glacier. They had now arrived near the pemmican cache, and a twenty-four hours' search was made for it, but it ended in failure. Peary and Henson had their noses frozen, and Lee and Peary each had a frost-bitten toe. Peary had hoped against hope that this cache would be found, although he had made up the rations of the journey without reference to it.

From this point the Eskimo returned along the tracks made by the sledges. Never before had any of their tribe penetrated the heart of the ice-cap.

Peary now took the lead with a sledge drawn by twelve dogs, and set the course by means of a boat-compass

lashed on the top of the load. Henson followed next with a sledge and trailer drawn by sixteen dogs; and Lee brought up the rear with a long sledge and trailer drawn by fourteen dogs.

When near the Petermann Fiord Basin, a storm delayed them forty-eight hours. At this camp two dogs were fed to the others. During the next week the long sledge was abandoned, and the loads rearranged.

An average elevation of 7670 feet had now been attained, and breathing was much more rapid on increased exertion. Henson and Lee frequently bled at the nose. The maximum elevation was found to be 7865 feet.

At the 400th mile one of the runners of Henson's sledge broke, and the greater portion of a day was spent in repairing the sledge with a runner from one of the trailers. This new runner, however, only did duty for 12 miles, when it broke beyond repair. The sledge was now converted into a three-runner one. On this day the last of the walrus-meat was fed to the seventeen remaining dogs. It was now a case of dog eat dog, and in a few days only eleven were left.

Peary saw that the land must be reached with all speed. He therefore dismantled the three-runner sledge and cached everything except a week's supplies. They were now on the downward grade, and on the second day they sighted land.

They were now over 500 miles from the Lodge in a direct line, and three of the eleven dogs were thoroughly exhausted. Peary decided to leave Lee here with the dogs, and push on with Henson in search of musk-oxen.

Peary and Henson started out from an elevation of 4800 feet above sea-level. Four miles from the tent many huge crevasses were passed. Peary recognised the group as one he had seen in 1892. Some miles beyond these large crevasses a great number of small ones were met,

into which both Peary and Henson frequently fell, but were always able to save themselves.

At the junction of the ice-cap with the land was a vertical wall of ice impracticable of descent. Finally a glacier was found over which they had to pick their way among crevasses.

The land consisted of bare jagged rocks which cut their boots and bruised their feet. Leaving the sledge behind, they wandered about the greater part of a day in a drizzling snowstorm in search of a practicable route, but failed to find one, or to see any game. Next day they returned to the tent on the ice-cap.

A serious condition of affairs now stared them in the face, but after very little discussion all agreed to stake everything on finding musk-oxen. They therefore started back for the cache, and when it was reached Peary and Henson were quite used up.

One sledge and scant rations for themselves on the return journey were left at this camp, and everything else was taken on towards the north.

When a point about 15 miles from the edge of the ice-cap was reached, Peary found that they were approaching the land on a course about 5 miles east of the one on which he had descended to it in 1892. He was here able to look over the eastern edge of the Academy Glacier basin, and make out the summits of the east-coast land considerably farther to the south than in 1892. Away due north a magnificent mountain was seen which was not observed in 1892.

A large cone of detritus passed in 1892 was reached just in time to take shelter from a storm which held them prisoners two days.

Peary here decided to leave Lee in the tent to give a frozen toe a chance to recover, and to take Henson and all the dogs with him in an attempt to find musk-oxen.

After travelling some miles, the sledge was stopped by a shallow cañon when abreast of Musk-ox Valley. Here Peary left the sledge and dogs and examined the valley, but could find no trace of musk-oxen. After making an attempt to pass down the cañon, and failing, they climbed out of it and made across country. A few miles beyond the valley, Peary shot a hare. Previous to this they were having recourse to the dog-food, but they now cooked and ate the entire hare. It was the first full meal they had had in thirty-five days.

Next morning they started for a valley between Musk-ox Valley and Navy Cliff. At the entrance of this valley traces of musk-oxen were found, and ultimately they were tracked to near the crest of some mountains. When about 200 yards from the oxen, Peary and Henson lay down behind a large boulder to regain their breath. It was almost a matter of life or death with them, and they quivered with excitement. At last they made a rush for the oxen, and fortunately, instead of running away, the oxen formed in line with lowered heads. In a few minutes several were shot, and the remainder took to flight. So hungry were the men that as they skinned the animals they ate the meat raw and thought it delicious.

After resting, they took up the trail of the remaining oxen. Having followed them for twenty hours, Peary's chagrin may be imagined when the oxen were ultimately found near the camp he had left. Being now thoroughly tired, they decided to take a few hours' sleep before attacking them, but when they awoke the oxen had gone. The trail was again taken up, but after a chase of several miles a snowstorm came on, and completely obliterated all tracks.

They now returned to the sledge, and using the musk-oxen skins, they formed a kind of tent into which they crawled, and were soon asleep.

Next day, Henson was sent back with the sledge and a load of meat to the moraine where Lee was. On the way there he came across the musk-oxen, but the dogs gave chase and thoroughly frightened them.

About the fourth day, Henson and Lee joined Peary, and an attempt was now made to reach the sea. Several days were spent in incessant climbing, scrambling, and jumping over rocks, but at the end of it they found themselves still some 3000 feet above sea-level. To reach the bay ice it would be necessary to carry supplies on their backs for some distance over rocks, then down a precipitous shore, across a glacier's lateral cañon, and then over several miles of crevasse-riven glacier.

Peary now found himself compelled to retrace his steps. A sharp look-out was kept for fresh traces of musk-oxen, but no signs were discovered.

To reach the moraine was a hard struggle, but they were able to leave it on the 1st of June to begin the homeward journey over the ice-cap. On the second day they were fortunate in finding the cache without much trouble.

Peary had now nine dogs and fourteen days' rations for them. For himself and his two companions he had thirty days' half-rations of tea, biscuit, and oil, and several days' rations of frozen venison.

On the 3rd June the distance travelled was $25\frac{1}{4}$ miles, but all the party had trouble with their feet and legs as a result of the severe work among the rocks. On the 6th June, Lee was ill and quite used-up, but by means of a line from the sledge to support himself by, he managed to struggle along. On the 7th two dogs were quite exhausted, and were fed to the other seven. On the 8th the larger of the two sledges was abandoned. On the 9th, after 4 miles' travelling, they were obliged to camp on account of Lee. After fifteen hours' rest and an extra

supply of milk, Lee was able to travel 20 miles during the following march. Another dog fell exhausted on the 11th, and another on the 12th, leaving five. On the 13th the five had been reduced to four, and on the 16th only three were left. On the latter date the last of the dog-food was consumed. On the 21st June the remainder of the venison was given to the two remaining dogs, and on the 22nd one of the two dogs died. On the 23rd the summits of the land appeared. The remaining dog was now given a pair of seal-skin boots and several yards of raw-hide line. Peary and his companions had four biscuits remaining for supper and breakfast. The Lodge was reached on the 24th June, and found to be intact.

The only dog to reach the Lodge was Panikpah, and it was fed by Peary before he ate anything himself. The memory of the famine-days on the ice-cap remained with the dog long after, and he might be seen at all times hiding away every bit of meat or blubber, and every bone he could find about the place. These noble dogs saved the lives of the party.

The journey of 500 miles across the ice-cap, from moraine to moraine, was made in twenty-five marches of an average of 20 miles. The weather on the whole was exceptionally good, or it would have been impossible to cover the distance in so short a time.

Early in the morning of the 3rd August the *Kite* arrived to take them home. On the way south two of the Cape York meteorites were successfully removed and shipped.

Peary made a summer voyage in 1896 for the purpose of obtaining the third and largest of the meteorites. Before, however, it could be got on board, the ship had to leave, in order to avoid being crushed by the ice.

Still determined to obtain the meteorite, Peary made another voyage in the summer of 1897, and was successful in shipping the meteorite and taking it to the United

States. This meteorite is the largest known, and its estimated weight is between 90 and 100 tons.

On 12th January 1897, Peary announced his plan for reaching the North Pole. A sufficient sum was to be raised to continue the work of exploration for five years, if necessary. A ship was to be taken north through Robeson Channel to the highest latitude possible along the Greenland coast. Stores were then to be landed and advanced in stages until the northern terminus of the North Greenland Archipelago was reached, and from this point a dash to the Pole would be made. Should the ship be unsuccessful in the passage of Robeson Channel, the party was to land at Hayes Sound and devote the first year to explorations of that unknown region.

In the spring of 1897, Morris K. Jesup suggested the formation of the "Peary Arctic Club," which raised funds for the expedition. At the end of 1897, Alfred Harmsworth offered the *Windward* to Peary, who accepted it. As it could steam only at the rate of $3\frac{1}{2}$ knots at most, Harmsworth offered to have the *Windward* re-engined, but unfortunately this could not be done owing to an engineers' strike. In consequence of this, Peary had also to charter the *Hope* as an auxiliary ship.

The *Windward* left New York on 4th July 1898, but Peary sailed from Sydney, C.B., in the *Hope* on the 7th. As soon as the Whale Sound region was reached, Eskimo were engaged, and the work of hunting walrus for dog-food was prosecuted by both ships.

At Etah, on 13th August, the two ships separated, the *Hope* bound for home, and the *Windward* for the north. After a good deal of trouble with the ice, the *Windward* reached Cape D'Urville, near Cape Hawks, on the 18th, but was here stopped by a large floe, and before the ship could get farther it was frozen in.

As soon as Peary saw that preparations for winter would require to be made, he landed a year's supplies at the cape. He then took steps to secure fresh meat, and in a short time a considerable number of musk-oxen were obtained. He also began to survey the region near Hayes Sound. He discovered that Bache "Island" is a peninsula, and that "Hayes Sound" does not exist.

Peary now decided to utilise the winter moons in pushing supplies north as far as Fort Conger, where he purposed to take his party in February. From Fort Conger he intended to make an attempt on the Pole in the spring.

Now commenced a series of desperate sledge-journeys. Snow igloos were formed at several of the capes. At the end of October, Peary advanced some supplies as far as Cape Frazer. At the end of the November moon about 30 cwt. of supplies had been sledged as far as Cape Wilkes, on the north side of Richardson Bay. The mean daily minimum temperature was more than 40° below zero, and on four successive days it was 50° below zero.

In the first light of the December moon, Peary with Henson and the doctor and four Eskimo left the ship with the intention of reaching Fort Conger. On the 28th all the supplies had reached Cape Lawrence on the north side of Rawlings Bay. Next day Peary started from Cape Lawrence with light sledges for Fort Conger. On the way the cold was so intense that it was too much for one of the Eskimo, who had to be left in a burrow in a snow-drift with a companion to look after him. Before Fort Conger was reached the moon had departed, and Peary had to grope and stumble in complete darkness across Lady Franklin Bay. On the 6th January 1899 the party passed through the doorway of Fort Conger. Biscuit from the table where it had

lain fifteen years formed a lunch. On reaching Fort Conger, Peary had a suspicious "wooden" feeling in his feet, and on having them examined it was found that both were frost-bitten. He ultimately lost eight of his toes.

The party remained at Fort Conger until the 18th February, when a start was made for the *Windward*, which was reached in eleven days. The mean minimum daily temperature during this period was the astonishing one of −56·18° F., and on the day the *Windward* was reached the temperature went down to −65° F.

During April the supplies left at Cape Lawrence were moved to Fort Conger. On 19th April, Peary again left for Fort Conger, although he could not move without crutches, and Discovery Harbour was reached on the 28th. Early in May he attempted to make a reconnaissance of the Greenland north-west coast, but found Robeson Channel impracticable.

On the 23rd May, Peary and his party started for the ship, and covered the 250 miles in six days.

In July, Peary crossed Ellesmere Land to the west coast. Soon after his return from this trip, the *Windward* was able to make its way to Etah, where Peary communicated with a relief expedition in charge of Bridgman. At the end of August both the *Windward* and the relief ship were sent home, and Peary and his party were left at Etah, where the winter was passed.

On the 19th February 1900, Peary sent off a division of seven sledges to Fort Conger; on the 26th February other six sledges left; and on the 4th March he followed with nine sledges. He reached Fort Conger on 28th March, and learned that the advance parties had killed twenty-one musk-oxen close to Conger.

At Fort Conger, Peary decided to make a sledge-journey along the north coast of Greenland. He left on

the 11th April with seven sledges, and followed very much the same route taken by Lockwood, but did not go overland. The northern part of Cape Britannia Island was reached on the 4th May. From here he sent back the last of the supporting party, and pushed on north with Henson and one Eskimo. Lockwood Island was reached on the 8th May, and from the cairn erected by Lockwood, Peary took the record, which had been perfectly preserved. From here one march carried the party to Cape Washington, the farthest point seen by Lockwood. On rounding this cape, Peary saw another headland still farther north. Near this cape were very large glaciers which Peary believes are the birthplaces of the "floe-bergs." Still farther north another cape was found, to which Peary gave the name "Cape Morris Jesup." This was the most northern point of the Greenland Archipelago. From this point Peary started over the ice-pack towards the north, but found the ice impracticable. He reached 83° 50′, and returned. He then travelled eastward along the coast, which soon began to trend to the south-east. In the same latitude as Cape Washington was found a magnificent cape, which Peary named "Cape Bridgman." Two marches beyond this cape brought Peary to a point from which he recognised a mountain he had seen from the ice-cap south of Independence Bay. The weather was now very foggy, and Peary was compelled to stop at what he believed was an island in the mouth of a large fiord. To this island he gave the name "Clarence Wyckoff Island." He had now reached the 83rd degree on the east coast. After waiting two nights and a day for the fog to lift, he found it necessary to start on the return journey. He left records at this camp, and also at Cape Morris Jesup and Cape Washington. Quite a large number of musk-oxen were seen along this most northern land.

The return journey was begun on the 22nd May, and Cape Morris Jesup was passed on the 26th. They reached Fort Conger on 10th June.

The most northern point of the land to the north of Greenland had now been determined, and Peary arrived at the conclusion that it was not a favourable one from which to reach the Pole. The ice was very much broken, and there was a comparatively rapid motion towards the East Greenland current.

Peary now decided to winter at Fort Conger and make another attempt on the Pole, starting from Cape Hecla, on the north coast of Grant Land. During the autumn no fewer than 101 musk-oxen were killed.

On the 5th April 1901, Peary left Fort Conger with Henson, one Eskimo, two sledges, and twelve dogs for his northern trip. A few days after starting, he found that the condition of the party and of the dogs was such that he could not hope for success, and he therefore returned to Fort Conger.

On 17th April he started for the south with his entire party, and found the *Windward* at Payer Harbour on 6th May. He soon commenced to form new caches along the coast towards Conger; and in July no fewer than 128 walruses were killed for dog-food.

The winter of 1901–2 was passed at Payer Harbour, where six of the Eskimo died. On the 3rd March 1902, Henson was sent north in charge of six sledges, and on 6th March, Peary followed with seventeen sledges. The temperature was from 43° to 49° F. below zero. The distance of 300 miles to Fort Conger was covered in twelve marches.

On the 24th March 1902, Peary started north from Fort Conger with nine sledges for Cape Hecla. Finding deep snow near Cape Joseph Henry, Peary preferred to

take the ice-foot route round it rather than cross Feilden Peninsula. At the very extremity of the cape the sledges had to be passed along a shelf of ice 3 feet in width and 75 feet above the sea.

On 6th April, Peary, Henson, and four Eskimo left Crozier Island, and when opposite Cape Hecla turned north over the polar pack. Now began a desperate struggle over rough ice. The route was a continual zig-zag, and the pickaxe had to be used constantly. In deep snow the dogs floundered and were almost useless, and a sledge had now and again to be dug out of a hole among snow.

On the 12th April they were storm-bound by a gale from the west which caused leads to form. Under great difficulties the journey was continued till the 21st April. On this date the latitude was 84° 17′ 27″. The ice was still very rough, and the snow so deep that it was almost impracticable. The entire pack seemed to be in slow motion towards the east. Peary here decided to return. He hurried his departure in order to utilise as much of his outward tracks as possible. He found, however, that the movement of the ice had faulted the trail in various places, and it was only with great difficulty that it could be followed. Crozier Island was again reached on 29th April, and Fort Conger on 3rd May.

Fort Conger was left on 6th May, and Payer Harbour was reached on the 17th. The *Windward* arrived on the 5th August, and conveyed Peary and his party to America.

The year 1905 saw Peary again on his way to the north. His expedition sailed from New York on 12th July 1905 on board the *Roosevelt*. Etah was left on 16th August, and after various encounters with the ice the *Roosevelt* succeeded in reaching Cape Sheridan on 5th September. The vessel here suffered severe pressure,

which did considerable damage. It was not floated again until the following summer, and this position perforce became headquarters. The winter proved much milder than that which the *Alert* experienced in the same region.

During October many of the dogs died, and it was found that the cause of the trouble was cured whale-meat, several tons of which had to be thrown away. To make good this loss, many musk-oxen were obtained in the Lake Hazen district and along the slopes of the United States Range.

At the end of February 1906, Peary started on a sledge-journey with the object of reaching the Pole. In three marches he reached Cape Hecla, where his whole party assembled. From here he advanced over the pack-ice with one main and several supporting parties. Open leads and rough ice made progress slow, and a considerable portion of the track had to be cut with pickaxes. At latitude 84° 38′ a broad lead extending east and west as far as it could be seen completely barred the way. After a delay of six days, Peary's party managed to cross on young ice which bent beneath their weight. Three days later a gale began to blow, and lasted six days. The ice was broken up, and Peary and Henson were driven 70 miles to the eastward on a large floe. Peary could now receive no aid from his supporting parties, and he decided to make a dash northwards. His party now numbered eight. Everything was abandoned that was not absolutely necessary, and every energy was bent on establishing a record. The character of the ice was now much better than farther south, but cracks and narrow leads increased. By forced marches Peary reached 87° 6′ on 21st April. By this time his sledges were nearly empty, and the ice was still in motion towards the east. He was therefore compelled to start on the return journey.

On reaching latitude 84° a lead was encountered over which no crossing could be found, and they were forced to camp on a large floe which drifted steadily eastward. Here some sledges were broken up to cook dog-meat for the party. On the 5th May two Eskimo, sent out as scouts, reported young ice a few miles distant. It was decided to attempt to cross it. The thin ice bent beneath them, but by using snow-shoes the crossing was effected in safety.

During the next week the party had to cut their way through a terrible chaos of ice, and on the 12th May they reached the Greenland coast at Cape Neumayer. Here they succeeded in obtaining four hares.

Near Cape Neumayer sledge-tracks were found, and as these had no doubt been made by one of the supporting parties, Peary sent two Eskimo to follow the tracks. They returned next day with Clark and his three Eskimo, who were in a terribly famished condition. Fortunately, seven musk-oxen were secured, and for two days the party ate and slept.

The remainder of the march back to the *Roosevelt* was accomplished without any special difficulty. Peary now called in the relief parties who were still out. After a short rest, a trip was made to the west of Grant Land. New land, named "Crocker Land," was seen to the north-west. On the 30th July, Peary again returned to the *Roosevelt*, which next day started on the return journey.

Peary had decided that the ship was so badly damaged that it could not safely remain another winter exposed to the ice. He therefore determined to return home for repairs, and to sail again for the north during the following year. At Lady Franklin Bay it was feared that the ship would have to pass the winter there, but it fortunately managed to get free, and the voyage was resumed.

At Etah the *Roosevelt* was beached four days for repairs. Again the journey was resumed, but severe storms were encountered, and it was not till 13th October that the vessel reached Hebron, Labrador.

On 6th July 1908 the *Roosevelt* left New York to carry Commander Peary and his party once more to the Arctic regions. The necessary repairs to the ship had not been finished in time for an expedition in 1907. Sydney, Nova Scotia, was left on 17th July, and Etah on 18th August. The usual course was taken across Smith Sound to Cape Sabine, and then northward. Fog and ice were soon encountered, but the *Roosevelt* slowly worked her way north as far as Lincoln Bay, where she had to shelter several days. On 2nd September Cape Union was passed, and on the 5th of this month the *Roosevelt* went into winter quarters near Cape Sheridan—a little north of the position of three years before.

Commander Peary had decided to set out on his final attempt to reach the Pole from Cape Columbia. The winter was occupied in transporting supplies to this point.

On 15th February 1909 the first of the sledges left the *Roosevelt*, and Peary brought up the rear on 22nd February. The total of all divisions was 7 men of Peary's party, 59 Eskimo, 140 dogs, and 23 sledges. A start was made over the ice from Cape Columbia on 1st March. Bartlett had been sent on ahead to make a trail. From this point the party consisted of 17 Eskimo, 133 dogs, and 19 sledges, in addition to the 7 men in command. On the first day's march 10 miles were covered, and on the second the record made by Markham in 1876 was passed. A wide lake of open water was encountered on 4th March, and here the party were delayed till the 11th. A sounding taken here gave 110 fathoms. On the 14th the temperature registered minus 59° F. The first

supporting party was sent back on the 15th in charge of Dr. Goodsell, and on the following day Peary found it necessary to send back Professor McMillan, who was suffering from a badly frost-bitten foot. A sounding taken at this camp gave a depth of 825 fathoms, so that the Continental Shelf had now been passed. When latitude 85° 23′ had been reached, the second supporting party, commanded by Borup, turned back. The advance party had now been reduced to 20 men, 10 sledges, and 70 dogs. Leads were frequently met, but good marches were made daily. The third supporting party returned from latitude 86° 38′ with Professor Marvin in command. This reduced the advance division to 9 men, 7 sledges, and 60 dogs. The character of the ice was now favourable for long marches, but still there was danger from open leads. At the end of the second day's march progress was stopped by open water, and during the night the party found themselves in imminent danger. The ice had broken Bartlett's igloo adrift, and others were threatening to follow suit. It was with great difficulty that the party managed to save themselves and the dogs. There was considerable commotion in the ice during the remainder of the night and the whole of the next day. The ice then closed together and allowed the party to proceed. North of this point the surface improved, and consisted mostly of heavy old floes covered with hard snow and comparatively level. From latitude 87° 48′ the fourth and last supporting party, commanded by Bartlett, turned back.

Peary had now with him his servant Henson, who had been his faithful companion on nearly all his journeys; Ootam, who had been with him when he made his record three years before; two of the Eskimo who had been with Clark when they narrowly escaped death from starvation; and a fifth man was a young Eskimo who

had shown great eagerness for the work. Forty of the best dogs were selected, and five of the best sledges. The supplies were ample for forty days, and Peary believed that with the dogs he could make them last fifty days more.

A determined effort was now to be made to reach the Pole. During the first march of ten hours 25 miles were covered, and after a few hours' sleep another march of ten hours covered other 20 miles. Again a few hours' sleep, and a further march of 20 miles brought the party within sight of latitude 89°. The temperature at this time was 40° F. below zero. After a short sleep, the fourth march was made against a bitter wind, and the distance covered was estimated to be at least 25 miles. The party were now getting much fatigued, and it was found necessary to take a longer sleep before beginning the fifth march.

During these four marches the weather had been brilliant, but with the fifth it changed to a dense pall overhead, and the ice beneath was a ghastly white with no relief. The surface, however, was even better than before; there was scarcely any snow on the old floes, and a rise of temperature to 15° F. below zero reduced the friction of the sledges. In twelve hours no less than 40 miles were covered without a sign of a lead. A hasty noon observation was now made, and the latitude was found to be within 3 geographical miles of the Pole. Thirty hours were spent in making observations, in going some 10 miles beyond the camp and about 8 miles to the right of it. Flags were planted, photographs were taken, and the horizon was carefully searched through the telescope for possible land. The minimum temperature during the thirty hours was 33° F., and the maximum 12° F. below zero.

Peary had now at last reached the goal of his ambition—

the goal he had been fighting to reach through many years and under tremendous difficulties. His dogged perseverance and stern determination must excite the warmest admiration of every one. During the twenty-three years from 1886 to 1909 he passed fifteen summers and eight winters in the Arctic regions. No matter what view we may take of Dr. Cook's great achievement, we must admit that Commander Peary, much more than any other man, deserved the great honour of being the first to reach the North Pole.

The return journey was begun on the afternoon of 7th April. The distance from Cape Columbia had been travelled in thirty-seven days, but Peary in returning wished to cover five of the outward marches in three, and he practically succeeded. For a large part of the way he was able to return on his former track, and he had therefore the further advantage of not requiring to build snow-huts. Cape Columbia was reached on 23rd April, so that the distance of 475 English miles from the Pole had been travelled in the astonishing time of sixteen days—an average of about 30 miles per day.

On arrival at the *Roosevelt*, Peary learned that Professor Marvin had been drowned. Returning in command of the third supporting party, Marvin had reached within 45 miles of Cape Columbia. He had gone on ahead of his Eskimo, and had broken through young ice covering a recent lead. When the Eskimo arrived, they found Marvin's body floating in the water some distance out from the ice.

On 18th July the *Roosevelt* left her winter quarters, and reached Cape Sabine on 8th August.

Peary's final expedition brings out in a striking manner the contrast between his methods and those of the British Expedition of 1875–76. Commander Markham and Sir George Nares were emphatic in their opinion that it was

utterly impracticable to reach the North Pole over the ice from the north of Grant Land. Peary's route was considerably to the west of Markham's, and no doubt escaped much of the crushed-up ice encountered by the British, but the fact that the full distance to the Pole was covered in thirty-seven days, on at least eight of which Peary was detained by open water, proves that the methods adopted were incomparably superior.

CHAPTER XIV

DR. COOK'S EXPEDITION (1907–9)

[Dr. Cook's statements, both as regards Mount McKinley and his discovery of the North Pole, have been seriously called in question. The writer prefers to accept his statements until his opponents prove that they are false.

According to the latest reports, a committee of the American Explorers' Club have examined Dr. Cook's data regarding his ascent of Mount McKinley, and have come to the conclusion that his data do not stand the test to which they were submitted.

The Council of the Copenhagen University, to whom Dr. Cook sent certain documents for examination, have decided that from the material supplied no proof can be adduced that he reached the North Pole.

As Dr. Cook's instruments and most of his astronomical observations were left behind at Etah, and are still there in consequence of Peary's refusal to allow them on his ship, it is impossible at present to pronounce a final judgment.]

Dr. Frederick A. Cook first took part in Arctic exploration as surgeon and ethnologist to Peary's expedition of 1891. He was then twenty-six years of age. Before the expedition reached Greenland his services were required in a critical emergency. Peary received a fracture of both bones of his leg, and it was to Dr. Cook's skill that he owed a rapid and successful recovery.

Dr. Cook was one of the party on the ice-cap as far

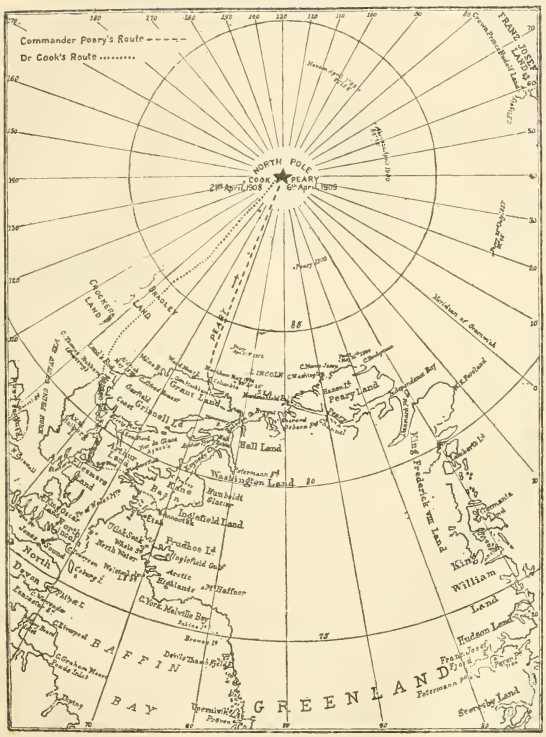


CHART OF NORTH POLAR REGIONS.

as Humboldt Glacier, and when Peary asked for a volunteer to accompany him to the farthest north, Dr. Cook was the first to offer his services. Peary decided to take Astrup, probably because he wished Dr. Cook to take charge of the base camp where Mrs. Peary and the remainder of the expedition had to wait anxiously till his return. Peary states that "to Dr. Cook's care may be attributed the almost complete exemption of the party from even the mildest indisposition, and personally I owe much to his professional skill, and unruffled patience and coolness in an emergency. In addition to his work in his special ethnological field, in which he has obtained a large mass of most valuable material concerning a practically unstudied tribe, he was always helpful and an indefatigable worker."

After his return from the Arctic, Dr. Cook had a great ambition to try the Antarctic, but did not obtain an opportunity till 1897, and he then had to go on very short notice. The Belgian Expedition had considerable trouble and some disappointment in connection with the surgeons appointed. The first candidate was put aside, after acceptance, for personal reasons, and the second declined to go at the last moment for family reasons. Without a knowledge of this difficulty, Dr. Cook cabled to Belgium from America, volunteering his services, though at the time he had not previously written a line, nor was he acquainted with a single individual of the expedition or its representatives. In reply, he received the instruction, "Meet us at Rio, end of September." He had only a few days to prepare himself and his outfit for a journey which might take one year or several. French was the language spoken on the ship, but Dr. Cook could not speak a word of it. The Commandant, however, could speak English, and all the scientific staff could speak German, with which Dr. Cook was familiar. This ex-

pedition, after doing some valuable work, was beset in the ice, and drifted throughout the whole winter. After an absence of fifteen months, it returned to civilisation in the spring of 1899.

Dr. Cook's next venture was an attempt to reach the summit of Mount McKinley, in Alaska, the highest mountain in North America. His first attempt was made in 1903, and although he reached a height of only 11,400 feet, he explored a good deal of new territory. His second attempt was made in 1906, and was successful. He began the ascent with two companions, but one of them became afraid of the crevasses in the glaciers and returned to the base camp. The summit, 20,390 feet above sea-level, was reached by Dr. Cook and Edward Barrille on 16th September in a temperature of 16° F. below zero.

In the following year, 1907, Dr. Cook quietly made preparations for a daring expedition to the North Pole. He was fortunate in having a wealthy friend, John R. Bradley, who paid all expenses. A strong fishing schooner was purchased and well stocked with suitable supplies. Mr. Bradley was especially interested in Arctic game, and a considerable time was spent in hunting walruses and other large animals. At Annootok, 25 miles to the north of Etah, a large settlement of natives was found, in a most prosperous condition, and here Dr. Cook decided to make his winter quarters. Rudolph Francke was chosen to be his only companion. The necessary supplies of food and fuel were landed from the schooner, and a winter house was soon erected. Steps were at once taken to secure a large supply of meat and blubber to support the Eskimo during the winter, and to make provision for the families during the absence of the men accompanying the expedition in the spring. The whole of the winter was occupied in preparing furs and equipment of all kinds.

Cook had an abundance of the best hickory wood, and

the sledges were made of a pattern combining the qualities of the Yukon and the Eskimo. Unlike many others, he did not abandon the old-fashioned iron shoes for strips of German silver. For dog-harness the Eskimo pattern was adopted, but in order to prevent the dogs eating the harness, the shoulder-straps were made of folds of strong canvas, while the traces were cut from cotton log-line.

Pemmican, made of pounded dry beef, sprinkled with a few raisins, some currants, and a small quantity of sugar, was selected as the staple food both for men and dogs.

Early in January 1908 some sledges were sent across Smith Sound to explore a route and to advance supplies. These advance expeditions were only partly successful, however, owing to storms having rendered the moonlight of little service.

The main expedition left Annootok on 19th February 1908. It consisted of eleven men, one hundred and three dogs, and eleven heavily loaded sledges. The crossing of Smith Sound to Cape Sabine was found to be about the most difficult part of the whole journey. The temperature was low, and as the season was early, there were only a few hours of sunlight daily. From Cape Sabine a course was made into Flagler Fiord. From the head of this fiord Ellesmere Island was crossed to Bay Fiord. In crossing the land the temperature went down to the astonishingly low figure of 83° F. below zero.

In Bay Fiord a large number of musk-oxen were obtained, which enabled the party to save their provisions. From Bay Fiord the expedition entered Eureka Sound, and proceeded northward along the coast of Heiberg Island. The ice was fairly smooth, and long marches were made. Caches of food and ammunition were left along Heiberg Island for the return journey, which Dr. Cook intended to make by way of Cañon Fiord. As an abundance of musk-oxen, bears, and hares were obtained, it was found unneces-

sary to use the provisions taken from Greenland. This also supplied them with sufficient fat to use as fuel in the snow-houses which were nightly built for sleeping-quarters.

Svartevog, at the north end of Heiberg Island, was reached on the 17th March. A distance of nearly 400 geographical miles had been covered in twenty-eight days. This included the difficult and dangerous crossing of Smith Sound, and the crossing of Ellesmere Island. It was a remarkable feat, and justified the leader in daring the remaining 525 miles which lay between him and the Pole.

At Svartevog a cache was made in which were placed not only a large quantity of food, but also many discarded articles of equipment. Dr. Cook had decided to take only two Eskimo with him on the final part of the journey to the Pole. The two men chosen were Etukishuk and Ahwelah, each twenty years old. Twenty-six dogs were picked, and provisions for eighty days were loaded on two sledges. The sledges were made of hickory and had iron shoes. The provisions consisted of pemmican, musk-ox meat, tea, coffee, sugar, condensed milk, biscuits, and pea-soup. By way of fuel, 40 lb. petroleum, 2 lb. wood-alcohol, 3 lb. of candles, and 1 lb. of matches were carried. Each sledge carried 600 lb., which included the following articles of equipment: pails, cups, and teaspoons made of aluminium; 1 tablespoon, 3 tin plates, 6 pocket-knives, 2 butcher-knives, 1 saw-knife, 2 rifles, 110 cartridges, 1 hatchet, 1 Alpine axe, a 12-foot folding canvas boat, 1 silk tent, 2 reindeer sleeping-bags, and screws, nails, and rivets. The sledges weighed 52 lb. each, and the weight of the canvas boat was 34 lb. In addition to these, Dr. Cook had 3 compasses, 1 sextant, 1 glass artificial horizon, 1 pedometer, 3 pocket chronometers, 1 watch, 3 thermometers, 1 aneroid barometer, and a camera with films.

On the march Dr. Cook wore woollen drawers, a bird-

skin shirt, a blue-fox coat, bear-skin pants, kamiks and hare-skin stockings. A band of fox-tails was fastened under the knee and about the waist. A seal-skin coat and some extra clothing were also carried in the personal bag.

On the morning of 18th March six of the Eskimo left Svartevog on the return journey. Koolootingwah and Inugito were taken on by Dr. Cook as a supporting party to give assistance over the rough ice of the pack-edge. Shortly after noon Dr. Cook started over the polar floes, on a course slightly west of north. The first day's march covered 26 miles. Next morning the temperature was minus 56° F. Some troublesome crushed-ice was encountered on the second march, but yet the party added 21 miles to their credit. The difficulties increased on the third day, and the distance travelled was reduced to 16 miles. Here Dr. Cook sent his two supporting Eskimo back. They returned with empty sledges, and although their dogs had received no food during the previous three days, they hoped to cover the 63 miles to land in one long day's travel! They carried a letter instructing Francke to wait until 5th June 1908, and if Dr. Cook had not returned he was to place Koolootingwah in charge and go home, either by the whalers or by Danish ships to the south.

Dr. Cook believed that he had now passed beyond the zone of ice crushed by the influence of land-pressure. On the morning of the fourth march the temperature was at the low figure of 63° below zero F., but fortunately there was no wind. Heiberg Island was now nearly lost to view. A march of fourteen hours carried the party 29 miles. Soon after the usual snow-house was built, a storm arose, and a further start was not made until the afternoon of the following day. From minus 59° the temperature rose to minus 46°, but the wind made the party feel the piercing cold very keenly. This march brought them to a great lead several miles wide. It was covered with ice

too thin to be crossed with safety. A partially bridged place was, however, discovered about a mile from camp, and the low temperature during the night had strengthened the ice sufficiently for an attempt to be made to cross it. On snow-shoes, Dr. Cook led the way with spread legs. In two crossings all the supplies were landed on the other side.

This was probably an extension westwards of the same lead encountered by Peary, and may indicate the dividing line between the central polar pack and the land-ice.

A course was now set to reach the 85th parallel on the 97th meridian. At noon on the 24th March a satisfactory observation gave the position as latitude 83° 31′; longitude, 96° 27′. From here a glimpse was obtained of what was believed to be Crocker Land away to the west.

The bright light of the sun now began to trouble the eyes, but amber-coloured goggles were found to be a very satisfactory protection.

On the 25th March a hurricane was experienced, and during the storm the temperature rose to minus 26° F. The ice cracked with thundering noise, and Dr. Cook sank into a crevasse which formed under the floor of the snow-house where he was lying in his sleeping-bag. He was, however, quickly pulled out by the Eskimo.

During the next three marches it was estimated that 53 geographical miles were travelled. A cold wind was blowing from the west, and added much to the misery of the party by forming icicles on every hair about the face.

On the night of 28th March a violent storm swept away the dome of their snow-house and buried them under a considerable quantity of snow, from which they extricated themselves with difficulty.

Next day the weather improved, and on the 30th March the clear atmosphere enabled them to discover land some

distance to the west, extending parallel to the line of their route. The position at this time was found to be 84° 50′, and longitude 95° 36′. This land gave the impression that it probably consisted of two islands, and was named by Dr. Cook "Bradley Land." It was seen to extend from about 83° 20′ to about 85° 11′ near to the 102nd meridian. It was buried under snow, and resembled the high lands of Heiberg Island.

Dr. Cook has stated that from latitude 83° 31′ a glimpse was obtained of what was believed to be Crocker Land away to the west. He now states that Bradley Land extends as far south as 83° 20′. If this is correct, Bradley Land must include Crocker Land.

The weather again changed on the 31st March, and hid the land from view. Strong winds made progress rather slow for several days. On 7th April the sun was first observed above the horizon at midnight. The journey had now lasted from the time the sun first appeared above the horizon at midday until it did not set during the twenty-four hours.

On 8th April the position was ascertained to be 86° 36′, longitude 94° 2′. In nine days 106 miles had been covered, in a temperature ranging from 36° to 46° F. below zero. Dr. Cook at this time remarked that in dreams Heaven was hot, and the other place was cold.

On 11th April the latitude was 87° 20′, and the longitude 95° 19′. Ice conditions now improved, and good distances were made. For two days the march was over old ice without pressure-lines or hummocks. The winds, however, were still bitterly cold, and on 13th April Ahwelah nearly collapsed. The position on the 14th was 99 miles from the Pole. Some of the dogs had already been killed to feed the others, but a sufficient number remained to enable the party to make a determined effort to cover the remaining distance to the Pole.

On to the 89th parallel the ice was in large fields and comparatively smooth. The noon observation on 19th April gave the latitude as 29 miles from the Pole, and the longitude 94° 3′. The next march was made under great excitement, and when camp was pitched it was within 14 miles of the goal, in longitude 94° 52′. Shortly after midnight of 21st April the party again set out, and when the pedometer had registered 14½ miles camp was made. The observation here gave latitude 89° 59′ 45″. A distance equal to the 15″ was advanced, the tent was pitched, and a snow-house was built so that the party might stay long enough for two rounds of observations to be made. The temperature was 38·7° below zero.

The North Pole had at last been conquered. The struggle which had been carried on more than three centuries was finally over. It had cost many lives and unparalleled hardships before man's ambition was satisfied. And what a desolate spot to have aroused the competition of nations! No land was in sight, no life had been seen within a long distance of it, and nothing but endless fields of ice and snow stretched away to the horizon. Yet here was the most interesting geographical point on the surface of the earth; here was the axis on which the world turned.

Soon after midnight of 22nd April, Dr. Cook and his two companions began their return journey. They set their course along the 100th meridian, and during the first few days, with fair weather and good ice, they succeeded in making long marches. On 30th April the latitude was found to be 88° 1′, and the longitude 97° 42′. As this showed a drift to the eastward, a more westerly course was set. The temperature still remained between 30° and 40° below zero, and the wind was again troublesome. Dr. Cook, with compass in hand,

marched ahead of the sledges. Near the 88th parallel very heavy ice was crossed.

On the 6th May they were stopped by a very severe snowstorm. An attempt was made to build a snow-house, but the wind swept the blocks away. An effort was then made to put up the tent, but this was found impossible. In sheer despair, they crept under the tent without erecting the pole. For several days the wind was too strong to allow them to travel, and the atmospheric conditions made it impossible to take observations. Added to these difficulties was the fact that the food-supply was running short.

On 24th May the weather cleared sufficiently to enable Dr. Cook to make an observation, which placed them on the 84th parallel, near the 97th meridian.

The temperature now gradually rose to zero, and caused the formation of a fog which proved a serious obstacle to progress. It was Dr. Cook's intention to make for his cache in Nansen's Sound, but when next the sky cleared, after a long struggle, the party found themselves far south, in Crown Prince Gustav Sea. Open water and broken ice made it impossible for them to reach Heiberg Island.

Dr. Cook was still anxious to return home in 1908, and when he saw that he was cut off from Annootok, he decided to make for Lancaster Sound, where he hoped to find one of the Scottish whalers. This allowed him to take advantage of the southerly drift of the ice. Passing through Hassel Sound, the party were fortunate in securing both bears and seals. Dr. Cook states that from this point they travelled southward over Norwegian Bay into Wellington Channel.[1] Here, however, they found the ice so much broken up that sledging was impossible, and

[1] Dr. Cook seems to have made a mistake here. His route was evidently west of Norwegian Bay.

early in July they crossed the island of North Devon into Jones Sound. Open water was again met, and the party were forced to take to the folding canvas boat. As there was no food for the dogs, they were left behind to shift for themselves. One of the sledges had also to be left, and the other was taken to pieces and carried in the boat.

Now followed a long struggle, partly by boat and partly by sledge. Birds formed their chief food, and in securing these the last of the ammunition was expended. Baffin's Bay was reached early in September, but it was found impossible to return to Greenland or to reach a place of safety farther south. The only alternative was to make a winter hut and endeavour to secure sufficient food to carry them through till the following spring. They returned westwards to search for a suitable place to winter, and found it at Cape Sparbo, in Jones Sound. Here an underground hut was made of stones, bones, and turf; and by means of primitive weapons they succeeded in killing a sufficient number of animals to enable them to live through the winter, and to provide food and equipment for the return journey to Greenland.

On 18th February 1909 the winter quarters were left, and Annootok was reached on 15th April. Anxious to return home as speedily as possible, Dr. Cook set out for the Danish settlement at Upernavik, where he arrived on 21st May. From there he travelled to Copenhagen by Danish steamers.

This journey by Dr. Cook is unparalleled in the history of Arctic exploration. The bare idea of attempting to reach the North Pole, in one season, from the latitude of Annootok, was daring in the extreme. It is probably correct to say that no Arctic authority could expect that he would have the smallest chance of success. Many expeditions with much greater resources than Dr. Cook

possessed had in the same region made the attempt from points hundreds of miles nearer the Pole, and had suffered utter defeat. Markham's starting-point was about 240 geographical miles nearer the Pole, and his farthest north was 400 miles from the Pole. Lockwood's base was over 200 miles nearer the Pole, and his record was only 4 miles farther than Markham's. Dr. Cook was well aware that Commander Peary himself, by far the most experienced of Arctic explorers, had repeatedly made attempts from a base much nearer the Pole. Starting from Lockwood's base in 1900, his farthest point reached was 370 miles from the Pole. A second attempt from the same point in 1902 reached a latitude 343 miles from the Pole. In 1906 his third trial was made from a ship situated more than 240 geographical miles nearer the Pole than Annootok, but the farthest north attained was still 174 miles from the Pole.

This was the position when Dr. Cook decided to make the attempt from Annootok. It is not surprising, therefore, that those acquainted with the history of the subject should find a serious difficulty in at once accepting Dr. Cook's statement that he had accomplished such an extraordinary achievement.

His idea of avoiding the route through Kennedy Channel and adopting a course sufficiently west to escape the crushed-up land-ice was no doubt a good one, but making every allowance for this advantage, the contrast between his expedition and Commander Peary's expedition of 1909 is very great. Commander Peary had relief parties to assist him until he was within 132 geographical miles of the Pole. His problem then was to travel these 132 miles and return to land 413 miles distant. Dr. Cook, on the other hand, was about 462 miles from the Pole when his last supporting party left him. To reach the Pole he had therefore to travel 462 miles against

Peary's 132, without being able to obtain any further supply of food. The return journey, again, was very different. Dr. Cook expected to find his cache 525 miles distant, but in reality the first land reached was more than 670 miles from the Pole. The total distance in latitude covered by Peary with the supply he was able to carry on his sledges was therefore 545 miles, whereas Cook states that he covered the extraordinary distance of 1132 miles.

Dr. Cook has still to satisfy experts, but no one will question the fact that Commander Peary has reached the North Pole; so that, no matter what the result of the unfortunate controversy may be, to the American nation belongs the great honour of winning the coveted prize.

During more than three centuries the record was held by the British. It was then captured by America in 1882. In 1895 it passed into the hands of the Norwegians, who held it until won by the Italians in 1900. America regained it in 1906, and now must keep it finally.

The chief records are as follows:—

British	Parry	82° 45′ on 25th July	1827.
	Markham	83° 20′ „ 12th May	1876.
American	Lockwood	83° 24′ „ 13th „	1882.
Norwegian	Nansen	86° 13′ „ 7th April	1895.
Italian	Cagni	86° 34′ „ 24th „	1900.
American	Peary	87° 6′ „ 21st „	1906.
American	Cook	90° „ 21st „	1908.
	Peary	90° „ 6th „	1909.

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